

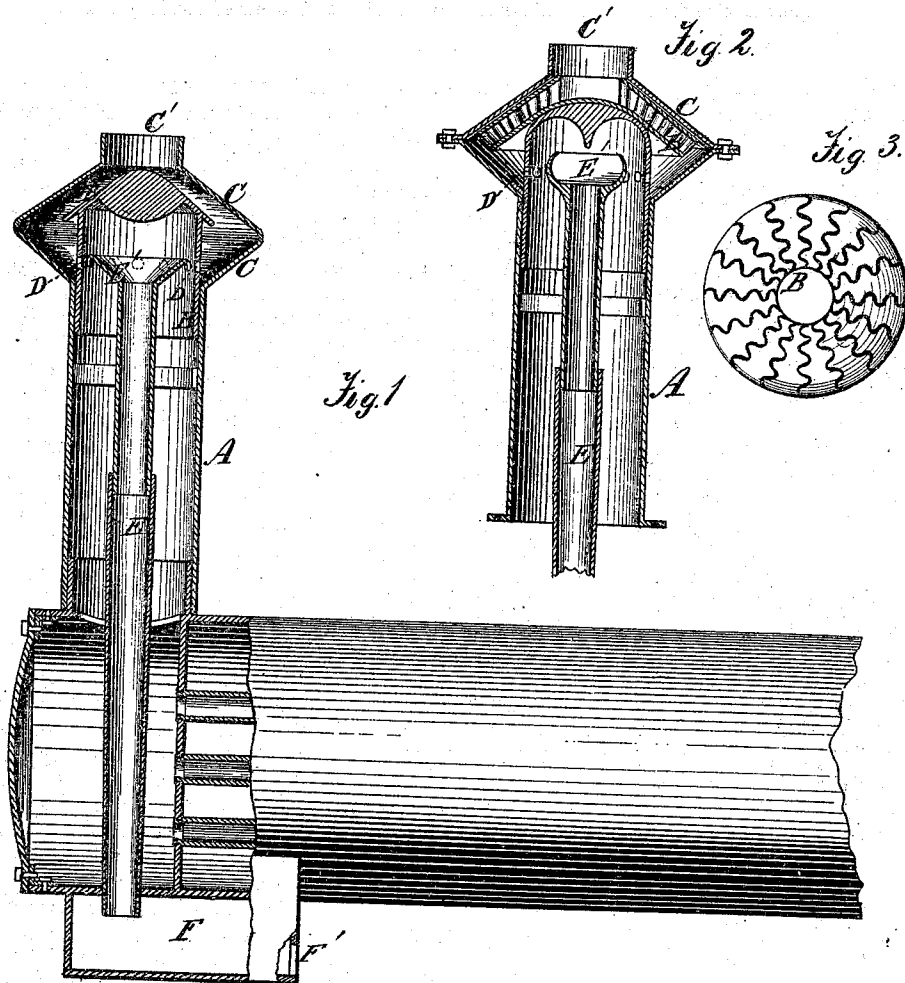
(94.)

WILLIAM F. GRASSLER.

Improvement in Spark Arrester.

No. 122,600.

Patented Jan. 9, 1872.



Witnesses.
Pedro J. Cole
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UNITED STATES PATENT OFFICE.

WILLIAM F. GRASSLER, OF MUNCY, PENNSYLVANIA.

IMPROVEMENT IN SPARK-ARRESTERS.

Specification forming part of Letters Patent No. 122,600, dated January 9, 1872.

Specification describing certain Improvements in Smoke-Stacks, invented by WILLIAM F. GRASSLER, of Muncy, in the county of Lycoming and State of Pennsylvania.

This invention relates to that class of smoke-stacks which is used upon steam-generators and furnaces where it is desirable to separate the gaseous products of combustion and any steam which may be caused to pass through the stack from the sparks or solid products of the fuel which may be carried into said stack by the draught, or by any artificial blast which may be applied to the generator or furnace, its novel features being fully set forth hereinafter.

Figure 1 shows a portion of a tubular steam-generator, partly in section, having placed upon it a smoke-stack in sectional elevation, embodying my improvements. Fig. 2 shows a modification of the stack in sectional elevation. Fig. 3 is a plan view of the cone shown in Fig. 2, showing the passages for the steam and gases.

Corresponding letters refer to corresponding parts in the several figures.

In constructing stacks of this character I use for the outside case A sheet metal of any desirable kind, iron being well adapted for the purpose. This case is to be of any length and diameter required for the capacity of the generator or furnace to which it is applied. At the upper end of this pipe or case A there is placed a chamber, consisting of two frustums of cones, C C, joined together at their bases, one of them being inverted, as shown in the drawing. This chamber is intended to receive the steam and gases from the pipe or case A through a series of apertures, D, formed in a short section of pipe, B, which extends upward into the gas-chamber formed by the two frustums C C, said short section having its upper end covered by a cap, the outer and inner surfaces of which are both conical, the inner or lower surface for the purpose of deflecting the sparks and solid products of the fuel downward, and the upper surface for the purpose of forming a passage for the steam and gaseous products of combustion between it and the outer portion of the chamber. This interior cone and the short section of pipe to which it is attached may be made of sheet or cast metal, the latter being preferred, especially in cases where steam is admitted to the stack, as it is less liable to deterioration

consequent upon corrosion. Within the pipe or case A there is placed another and a smaller pipe, E, its upper end being provided with a funnel-shaped enlargement, E', the upper end of which should be about upon a line horizontally with the lower point of the cone upon the section B of the pipe, so that as the sparks and other solid portions of matter, such as ashes and dust from the burning fuel and small pieces of such fuel, are carried by the blast or draught up through the pipe A and into the short section B, against the conical surface upon its inner or lower side, they shall be, by such surface, deflected downward into the funnel E', and from thence conducted down through the pipe E into the dust-box F, which is arranged upon the under side of the generator, as shown in Fig. 1. The diameter of the pipe E should always be such as to leave between its outer surface and the inner surface of the outer pipe ample room for the ascending column of sparks, dust, and gases. The dust-box F, upon the under side of the generator, is for the reception of the sparks and dust which have passed down through the pipe E, there being an opening in its rear side for withdrawing such sparks therefrom; or such opening may be upon one side, if found more convenient; or the pipe E may be so formed as to cause its lower end to pass out through the smoke-box at some other point. Fig. 2 shows a modification of my stack so far as relates to the cone upon the short pipe B, it being constructed as there shown, which form gives a passage for the steam and gases through the upper portion thereof and between the corrugated division-plate, which has a tendency to separate from such gases any fine dust that may not have been deflected into the central pipe.

The operation of this stack is as follows: The parts having been constructed and arranged substantially as described, and a fire having been kindled in the generator or furnace, the draught or blast causes the gases to pass through the flues or tubes of the generator, which passage always induces the passage of more or less of the solid portions of the products of combustion, such as sparks, dust, and small portions of coal or wood, and these, being mingled with the gases pass up within the outer pipe and into the short pipe or section B

and strike the conical surface, and here the separation takes place, the solid portions or particles being deflected downward into the pipe E, while the gaseous portions, mingled with the steam that may have been let into the pipe, pass down to the perforations D D, and out through them into the chamber C C, and thence out into the atmosphere through the opening C' in the top of the stack.

The advantages due to this form of construction are that it is cheap and durable, it gives a free draught when no artificial means are used for that purpose, and it effectually separates and retains the sparks and dust which are so annoying to passengers, and so dangerous to the property in the country through which it passes when used upon locomotives, for which purpose it is well adapted and principally intended.

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

1. The combination, in a smoke-stack, of a straight or cylindrical portion, A, having upon its upper end a gas-chamber, formed by the frustums C C, or in an equivalent manner, with an outlet, C', and a short section of pipe, B, having conical upper and lower surfaces, and a series of apertures for the escape of the gases, substantially as and for the purpose set forth.

2. The combination, in a smoke-stack, of a short section, B, the central pipe E, and the dust or spark-box F, the parts being constructed and arranged substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WM. F. GRASSLER.

Witnesses:

WM. BRINDLE,
ROBT. McCURDY.

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