W. F. GRASSLER.

Spark-Arresters, &c.

No. 133,436. Patented Nov. 26, 1872.

Fig. 1.

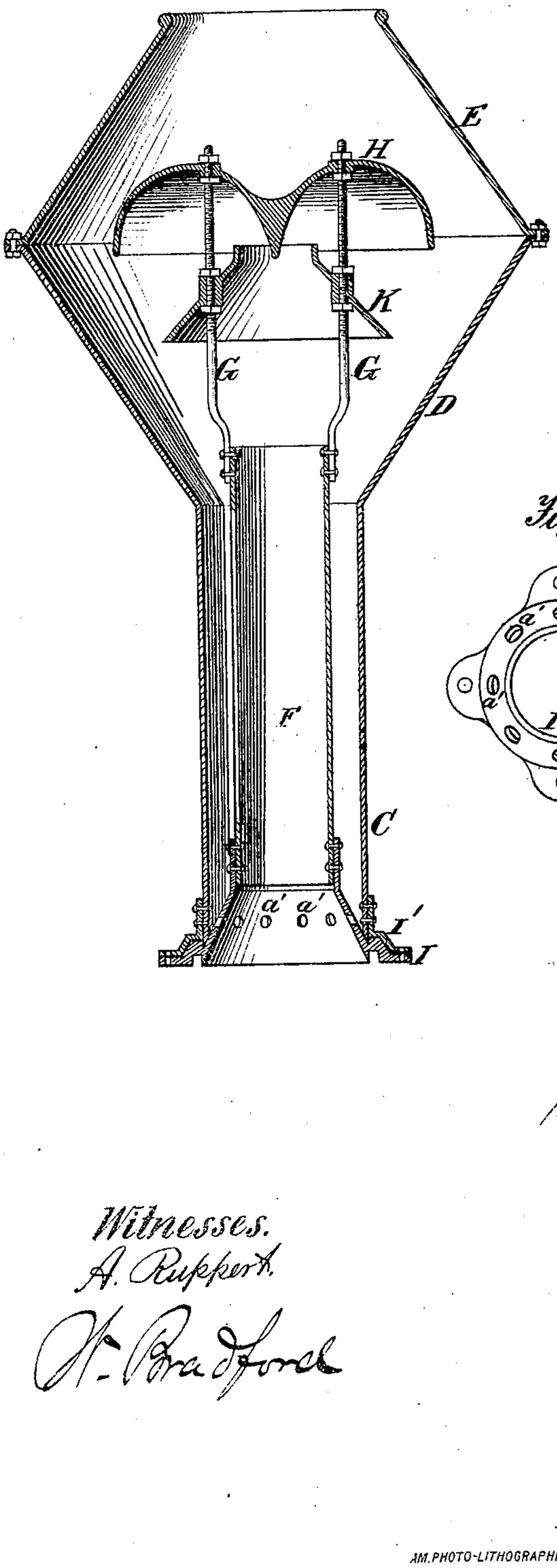


Fig. 3.

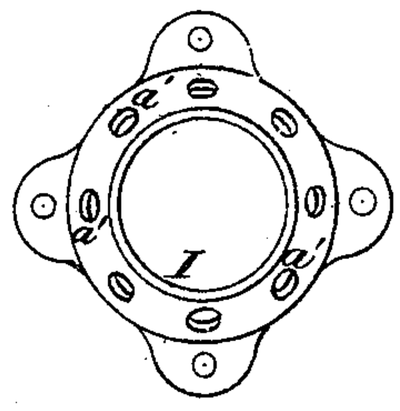
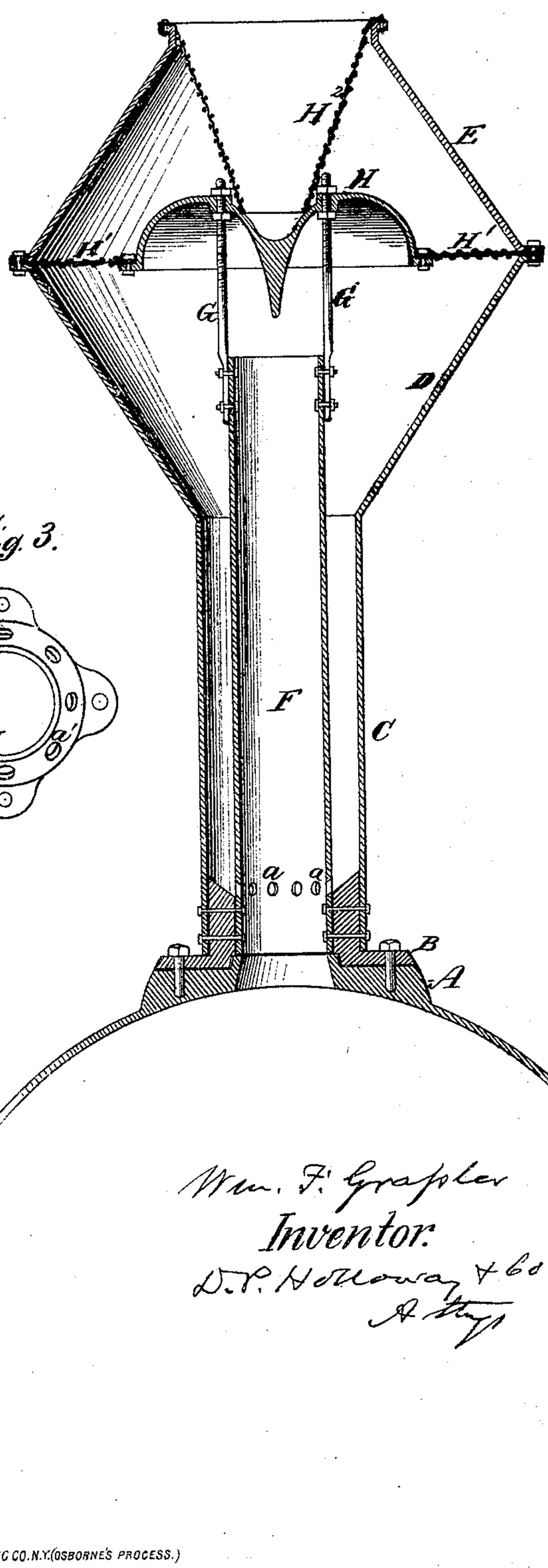


Fig. 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

WILLIAM F. GRASSLER, OF MUNCY, PENNSYLVANIA.

IMPROVEMENT IN SPARK-ARRESTERS, &c.

Specification forming part of Letters Patent No. **133,436**, dated November 26, 1872.

To all whom it may concern:

Be it known that I, WILLIAM F. GRASSLER, of Muncy, in the county of Lycoming and State of Pennsylvania, have invented certain Improvements in the Smoke-Stacks of Locomotive, Marine and Stationary Engines, Chimneys, and Flues, of which the following is a specification:

This invention more particularly relates to that class of smoke-stacks which are used upon steam-generators and furnaces; but it may also be used upon chimneys and flues of fireplaces and fire-hearths where it is desirable to arrest the sparks and cinders or solid particles of the fuel which may be carried upward into a smoke-pipe, chimney, or flue by the draft of air or by any artificial blast or means which may be applied to the steam-generator or furnaces thereof, or to any fireplace or fire-hearth, so as to prevent said sparks and cinders or solid products of the fuel from escaping from or passing out from the top of the air or draft chamber connected with a smoke-pipe, chimney, or flue without arresting the draft thereof; and its novel features consist in the construction, combination, and arrangement of the several parts of which it is composed, as will be more fully described hereinafter.

In the drawing, Figure 1 is a vertical sectional elevation of my improved device, showing the parts in position; and Fig. 2 is a modification of the same, showing also some screens in the upper portion thereof for the purpose of aiding in arresting the sparks and cinders. Fig. 3 is a plan view of a perforated collar to be placed in the lower end of the spark-arrester.

In constructing spark-arresters of this character for locomotive-engines I use any suitable saddle A, which is attached to the smoke-box of the generator. To the upper surface of this saddle there is bolted or riveted a ring, B, of metal, the lower portion of which is provided with a flange for the purpose, while the upwardly-projecting portion serves as a support for the outer and inner pipes of the arrester. To the outer surface of the vertically-projecting portion of the ring B there is screwed a pipe, C, which is cylindrical in form, and is made of any suitable kind of metal. This pipe extends upward to any desired height, according to the generator or flue to which it is to be attached. When it has reached the desired height it has bolted or riveted to it an inverted frustum of a cone, D, which may be made of any suitable metal, and may be of any desired height and diameter at its upper end, the lower end being of proper diameter to allow of its being connected or attached to the cylindrical pipe C. Upon the upper end of this frustum there is formed a horizontally-projecting flange, to which there is bolted or otherwise attached another frustum of a cone, E, not inverted, the base of which is of the same diameter as that of the upper end of the inverted frustum, it being provided with a flange for the purpose of securing it to the lower frustum. This upper frustum diminishes in diameter from its base until it has been contracted to the proper diameter for the outlet for the steam and gases, when it is extended in a vertical direction for a short distance, and it may be provided with a ring or flange upon its upper end, to which to attach a screen of wire-gauze, if desired. The diameter of opening in the top of this spark-arrester may vary according to the volume of steam or gas, or of both, to be passed through it. To the interior surface of the ring B there is attached a cylindrical pipe, F, of smaller diameter than the outer one *c*, inside of which it rises, its upper end extending up into the inverted frustum D for, say, one-half, more or less, of its height. The diameter of this interior pipe is such as to leave a space between it and the outer pipe of, say, one and one-half inch, which space serves as an air or draft chamber, and also for a passage down through which the sparks and other solid products of combustion which have been carried up through the pipe F by the force of exhaust-steam from the locomotive, or by draft or blast of stationary or marine engines, can pass to a series of apertures, *a a*, of any desired shape in the lower end of said pipe, and thence into the smoke-box of a locomotive, or the furnace or flue of other forms of engines, and thus be brought into contact with the fuel or the flame thereof, and thus consumed, instead of being permitted to pass out of the arrester into the atmosphere. To the upper end of the pipe F rods or bars of metal G G are attached by bolts or rivets, which extend upward into the

upper frustum, their upper ends being provided with screws for the reception of nuts. Upon the upper ends of these rods or bars there is placed what may be termed an inverted bowl, H, the configuration of which is clearly shown in the drawing. Upon the under surface of this bowl there is placed or fastened a projecting point, the bowl being so placed as that this point shall be directly over the center of the pipe, and a short distance—say from three to six inches—above it, in order that as the sparks and other solid products of combustion are forced up the pipe they may strike upon the point and be deflected outward into the curved portion of the bowl, and by it be directed downward into the space between the two pipes, and from thence delivered into the smoke-box or flame, as above described.

I contemplate using, in connection with a spark-arrester constructed as above described, one or more screens, as shown at H^1 H^2. These screens, when used, may be made of wire-cloth or of perforated metal, and they may both be used, or either one may be used separately; they are, however, not indispensable, as the arrester will operate to arrest the sparks without them, but not as well as when one or both are used.

The above description has reference more particularly to Fig. 2 of the drawing. In Figs. 1 and 3 there is shown a modification of my improved device, in which the solid ring at the lower end is dispensed with, and there is substituted a perforated ring, I, which is made to fit upon a saddle placed upon the generator or flue, and extends upward into the outer pipe C for a short distance, its lower portion being conical or of such other form as will admit of there being formed in it apertures of any desired form for the passage of the sparks to the smoke-box or to the flame of the fuel, as described, in referring to Fig. 2. Upon the top edge of the conical or enlarged portion of this ring there is a vertically-projecting portion, to which the inside pipe F is secured. Outside of the perforated ring above described there is placed another ring, which is so connected as to rest upon the first one, and extend upward far enough to receive and support the outer pipe C, which is at its lower end bolted or riveted to it, as shown in the figure. The arrangement of the pipes in this modification is the same as those referred to in the description of Fig. 2, the same air or draft chamber being left between them for the same purposes. To the rods or bars G G, in this modification, and above the end of the pipe F, at a distance of six inches, more or less, there is secured an inverted truncated cone, K, having upon its upper end a vertically-projecting flange. This cone is hollow, it having an aperture in it for the passage of the sparks and such solid products of combustion as may pass through the pipe F. This cone forms what may be termed a spark and dust chamber, it acting to receive such and direct it toward the center of the inverted bowl H, which is placed upon the same rods which support the inverted cone, and at such a distance above it that the point of said bowl will enter the aperture in said cone, as shown in the drawing.

The other portions of this arrester, shown in this modification, are similar in construction and function to those described above.

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

1. The beveled perforated ring I, constructed and arranged substantially as and for the purpose set forth.

2. The combination of the inverted bowl H, screens H^1 and H^2, and interior perforated pipe F, substantially as and for the purpose set forth.

3. The combination of the interior pipe F, perforated ring I, supporting-rods G, inverted truncated cone K, and inverted bowl H. 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,

S. SMITH.