W. F. GRASSLER.
Spark-Arresters.

No. 137,438. Patented April 1, 1873.

Fig. 1.

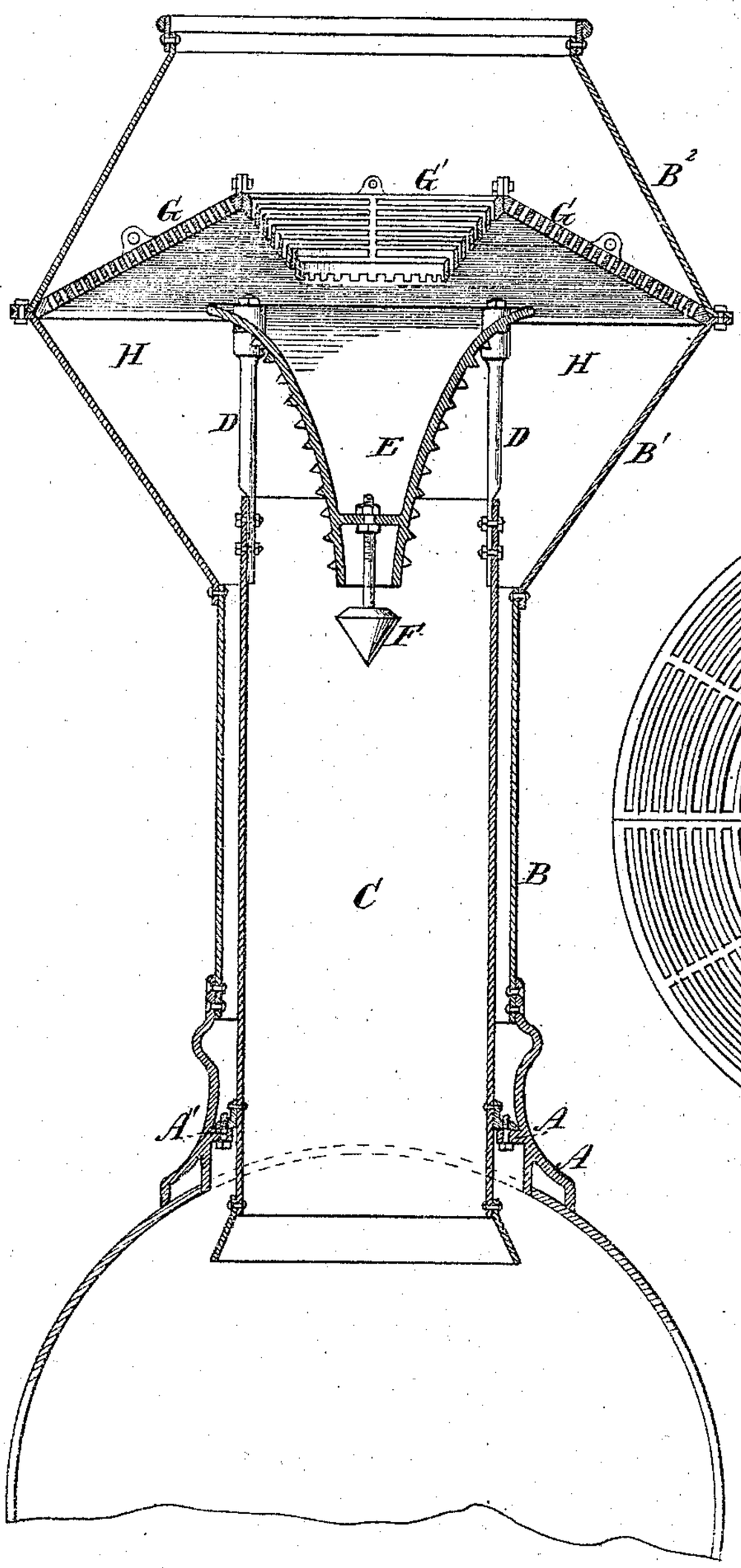


Fig. 5

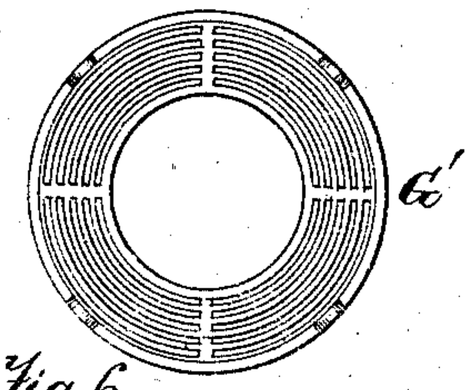


Fig. 6.

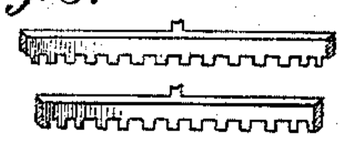
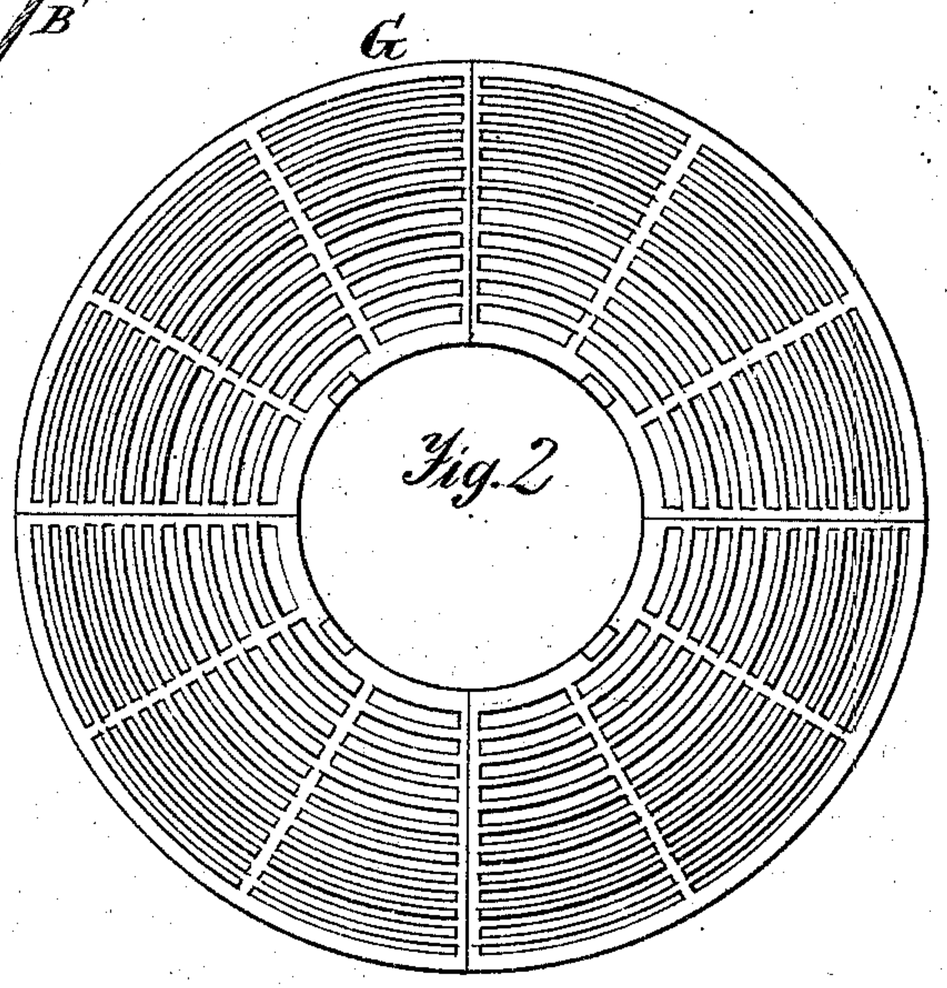


Fig. 2



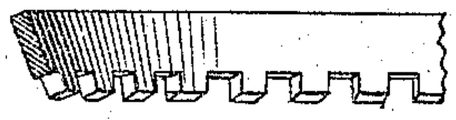


Fig. 3.

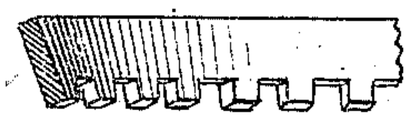
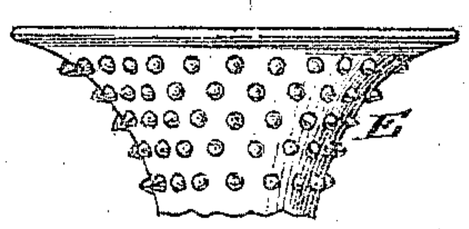


Fig. 4.



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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. **137,438**, dated April 1, 1873; application filed January 2, 1873.

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 Spark-Arresters, of which the following is a specification:

Figure 1 is a sectional elevation of my improved arrester and of a portion of the smoke-box of a locomotive steam-generator. Fig. 2 is a plan view of a portion of the conical spark-disintegrator, showing the construction thereof. Fig. 3 is a sectional elevation of parts of two of the bars of which the disintegrator is composed. Fig. 4 is an elevation of a portion of the inverted truncated cone or bowl, against which the sparks strike in ascending the pipe. Fig. 5 is a plan view of the inverted portion of the disintegrator; and Fig. 6 is an elevation of a portion of two of the bars of which it is composed, showing the serrations upon the lower surface thereof, and their position with reference to each other.

Corresponding letters refer to similar parts in the several figures.

This invention relates to that class of devices which are to be placed upon locomotive-engines, or upon the pipes or flues of stationary engines and other furnaces where fuel is burned; and it consists in providing such pipes with a spark-disintegrator of peculiar construction, and in the construction, combination, and arrangement of certain of its parts, as will be more fully explained hereinafter.

In constructing devices of this character I use a base, A, of such a form upon its under surface as to adapt it to rest upon the smoke-box of a locomotive-engine, or upon any furnace or flue to which it is to be applied. Upon the interior of this base there are formed lugs A′, to which to fasten an interior pipe, soon to be described. This base may be of cast or wrought metal, its upper end being adapted to the reception of the outer cylindrical pipe B, which is bolted or riveted thereto, and which extends upward for any required distance, according to the kind of generator or flue to which it is applied. Upon the top of this cylindrical portion there is secured an inverted frustum of a cone, B^1, which is made of sheet metal, and extends upward from the point where it joins the cylindrical portion B, at such an angle as will cause it to be of such diameter at its upper end as to receive the spark-disintegrator, at which point it is provided with a flange for attaching thereto said disintegrator, and a frustum of a cone, B^2, open at its upper end, said opening being of sufficient diameter to allow the gases from the burning fuel and the exhaust steam from the engine to pass out through it. Upon the top of the frustum B^2 there is placed a ring of metal, which serves to support the same, and also to form a short cylindrical portion of the arrester for giving an upward direction to the steam and gases. To the lugs A′ A′, upon the base A, there is bolted or otherwise secured an interior pipe, C, it being held in its proper position by means of angle-blocks, which are secured to it by means of rivets, said blocks resting upon the lugs A′. The diameter of this interior pipe is such as to leave a free passage up through it for the steam and gases, and also to leave between it and the interior of the portion B an annular space or flange of, say, two inches, more or less, for the sparks and cinders which have been carried upward by the exhaust steam and disintegrated in the upper portion of the arrester, to fall down through and be brought in contact with the flame which may pass through the flues of the generator. This pipe C extends down into the smoke-box for a short distance, and is provided with a funnel-shaped termination, as shown in Fig. 1, its office being to form an increased area of opening for the steam and gases to enter it, and also to deflect the sparks which fall upon its outer surface. The upper termination of this pipe is within the inverted frustum B^1, and at some distance above the outer cylindrical portion B, to which end there are bolted three or more supports, D D, the lower ends of which are secured to said pipe, their upper ends being provided with nuts for the purpose of holding and rendering adjustable vertically an inverted bowl, E, which is to be made of cast metal, or of any suitable material which will admit of having formed upon its outer surface suitable projections, as shown, for the purpose of, to some extent, arresting the momentum of the sparks and cinders while they are being deflected to-

ward the disintegrator, and also for the purpose of, to some extent, breaking up such material. Near the lower end of this bowl there is placed a cross-bar for the purpose of holding the stem of an inverted deflector, F, which is made adjustable vertically by means of nuts upon its stem, which are placed upon either side of the cross-bar of the bowl. As this deflector is located centrally in the pipe C, through which the steam and gases, as well as the sparks and cinders, pass, it will serve to distribute the same evenly to all parts of the disintegrator, which is located above it, and which is formed of two or more sections, G and G′, the outer one being divided into quarter sections transversely, as shown in Fig. 2, and composed of a series of metallic rings and bars, the rings having upon their lower edge a series of projections, as shown in Fig. 3, those on each alternate ring being opposite the spaces in the intervening ones, in order that the sparks and cinders, in passing through the spaces left between said rings, may be broken and pulverized as finely as possible, and the largest portion of them be prevented from escaping into the atmosphere by being compelled to fall down through the spark and dust chamber H into the annular space between the pipes B and C, the chamber H here alluded to being formed by the inverted conical frustum B^1, the frustum B^2, disintegrator G G′, and interior pipe C. The portion G′ of the disintegrator is located centrally in the portion G, it being inverted, and having its lower portion of less diameter than that of the upper end of the bowl E. This section is composed of a series of rings and bars, as shown in Figs. 5 and 6, spaces being left between such bars for the escape of gases, it being held in position by means of bolts passing through a flange upon its upper surface and through a similar flange upon the portion G. The lower surfaces of the rings of this centrally-located portion are provided with projections similar to those upon the bars of the outer portion, said projections being arranged opposite the spaces in the next ring, thus compelling the sparks and gases to travel in a zigzag course in passing out of the arrester, which, as they are driven against such projections on both sections of the disintegrator, has the effect to arrest the sparks and cinders and allow their own gravity to carry them downward, as above described, they being removed from the influence of the ascending currents by the direction given them by the deflector F and the bowl E.

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

1. The disintegrator G G′, when constructed and arranged to operate substantially as and for the purpose specified.

2. The combination of the disintegrator, inverted bowl, and deflector with the enlarged portion of a spark-arrester, substantially as shown, and for the purpose specified.

3. The combination of the adjustable deflector F and the inverted bowl E with the interior pipe of a spark-arrester, substantially as and for the purpose set forth.

4. The combination of the inverted bowl E and the disintegrator G G′, substantially as set forth.

5. The combination, in a spark-arrester, of an outer pipe, B B^1 B^2, an interior pipe, C, an inverted bowl, E, deflector F, and a disintegrator G G′, the parts being arranged to operate substantially as and for the purpose set forth.

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

WM. F. GRASSLER.

Witnesses:

WM. BRINDLE,

JOHN SHOEMAKER.