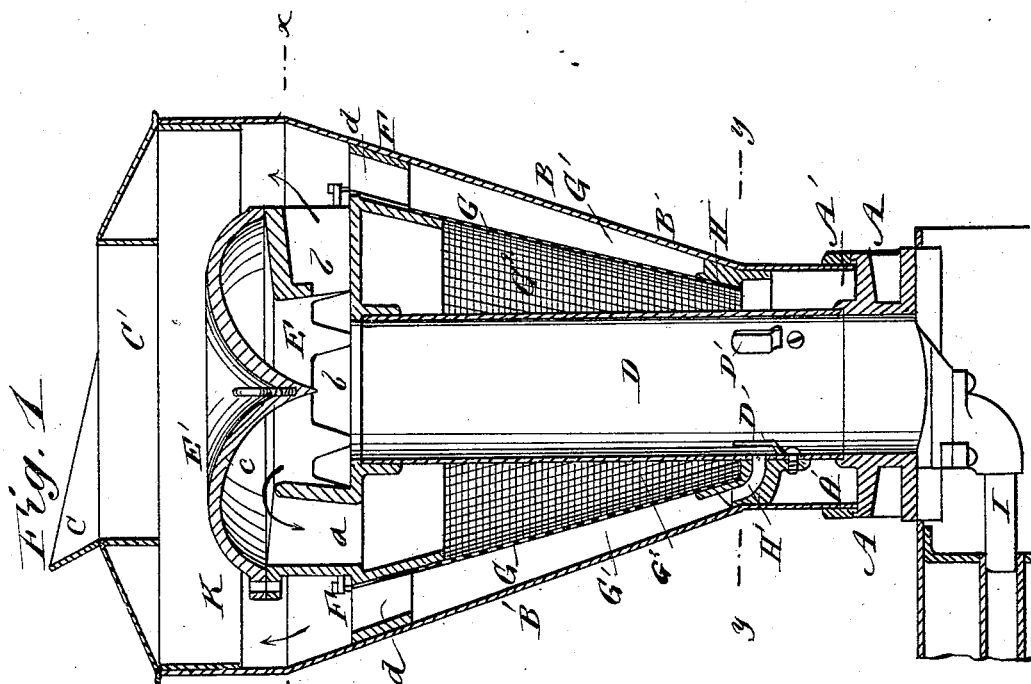
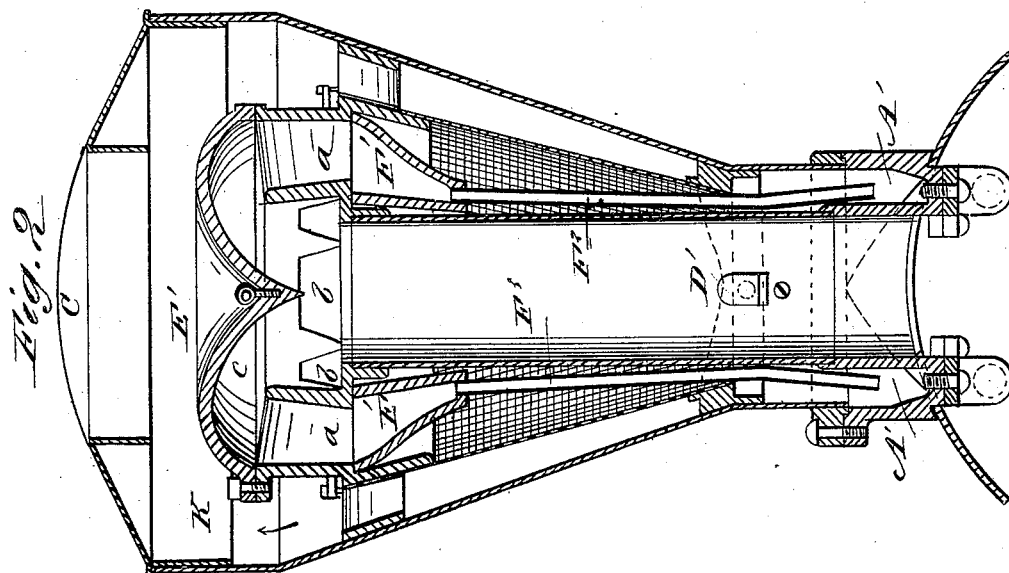


J. C. ALBRECHT.

SPARK ARRESTER.

No. 342,556.

Patented May 25, 1886.



WITNESSES:

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C. Sedgwick

INVENTOR:

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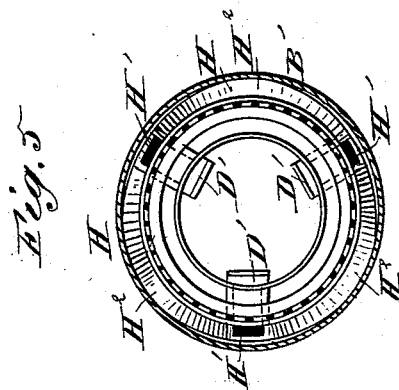
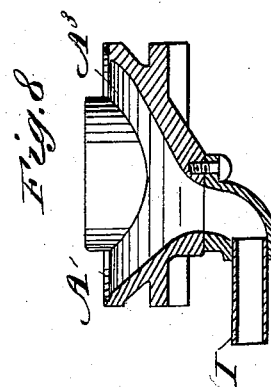
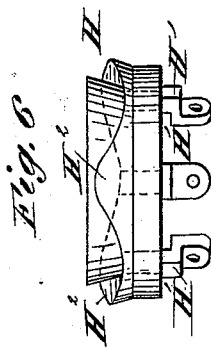
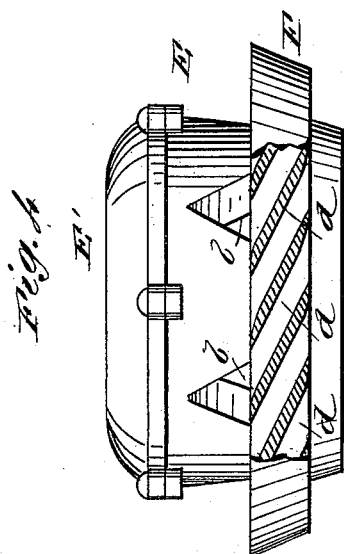


Fig. 7

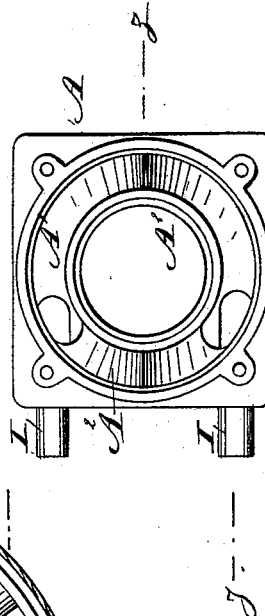
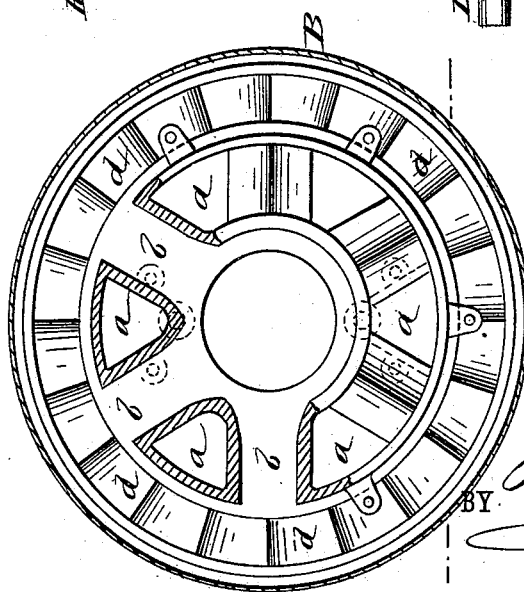


Fig. 3



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UNITED STATES PATENT OFFICE.

JOHN COLUMBUS ALBRECHT, OF COLUMBUS, GEORGIA.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 342,556, dated May 25, 1886.

Application filed January 29, 1886. Serial No. 190,251. (No model.)

To all whom it may concern:

Be it known that I, JOHN COLUMBUS ALBRECHT, of Columbus, in the county of Muscogee and State of Georgia, have invented a new and Improved Spark-Arrester, of which the following is a full, clear, and exact description.

My invention relates to the spark-arrester for which Letters Patent No. 295,322, dated March 18, 1884, were granted to me.

The object of my present invention is to provide a new and improved spark-arrester which separates the cinders from the smoke more effectively than those used heretofore, and which forces said cinders back into the fire-box for consumption, and at the same time increases the draft of the fire by means of a hot-blast from the smoke-stack, by which the cinders are carried back to the fire-box.

My invention consists of a cone which arrests and deflects the sparks, and of a device for facilitating the separation of the sparks from the smoke and carrying them more rapidly to the fire-box.

The invention also consists in various parts and details of construction and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal sectional elevation of a smoke-stack provided with my improvement. Fig. 2 is a transverse section of the same. Fig. 3 is a sectional plan view on the line $x x$, Fig. 1. Fig. 4 is a side elevation, partly in section, of my improved cone. Fig. 5 is a sectional plan view on the line $y y$, Fig. 1. Fig. 6 is a side elevation of the ring. Fig. 7 is a plan view of the saddle. Fig. 8 is a sectional side elevation of the same on the line $z z$, Fig. 7.

The saddle A is attached to the boiler of the locomotive in any suitable manner, and supports the smoke-stack B, provided on top with the cap C. The saddle A is provided with the side passages, A', having slanting bottoms A'', which open into the spark-flues I, leading to the fire-box of the boiler. These spark-flues may be either inside or outside of the boiler, as may be preferred.

The draft-pipe D extends from the top of the

saddle A to the platform F, attached to the flaring shell B' of the smoke-stack B, and this platform F supports the cone E. The cone E is provided with vertical radial passages a , and with an equal number of horizontal radial passages, b , each one of the latter being placed between two of the former. The cap E' of the cone E is formed on its under side into an inverted cone, c .

The platform F is provided with a number of slanting openings, d , extending downward in a spirial direction, like the threads of a screw. Two of the openings a in the cone E, placed opposite each other on each side of the central longitudinal line of the boiler, open into spouts or funnels F', provided with downwardly-extending pipes F'', terminating in the passages A' of the saddle A.

The spark-drum G is provided with perforations of any convenient size and shape, which perforations may be covered with caps or hoods of any suitable form at their lower and upper ends.

The spark-drum G is supported at its lower end by the ring H, attached to the flaring shell B' of the smoke-stack, and its upper end is attached to a ring-flange secured to the lower surface of the platform F in such a manner as to form the space G' between the shell B' and the drum G, and the space G'' between the drum G and the draft-pipe D.

The ring H is provided with the radial tubes H', leading to the draft-pipe D, the opening in the latter being protected by shields D', and with ridges H'', placed midway between the openings of the tubes H' and slanting downward toward the same.

The operation is as follows: The sparks and cinders driven by the force of the draft and exhaust are forced through the pipe D up to and against the lower surface of the inverted cone c of the cap E' of the cone E, and are deflected and guided down through the openings a into the spark-drum G, and thence are driven back through the passages A' of the saddle A, and through the spark-flues I into the fire-box of the boiler. The smoke and gases pass from the interior of the cone outward through the openings b , when the engine is at rest, and thence upward to the air through the cylindrical opening of the sleeve C' of the cap C. When the engine is at work,

the smoke and gases are driven by the exhaust upward against the under surface of the inverted cone, and thence downward through the passages *a* into the drum *G* and through the perforations in the wall of said drum *G* into the space *G'*, from which they pass upward through the spiral openings *d* into the space *K*, surrounding the cone *E*, and from there through the sleeve *C'* of the cap into the air. Thus the passage of the sparks from the mouth of the draft-pipe into the spark-drum *G* is obviously more direct, and hence easier, than through the cone described in my former patent, and the drum *G* is relieved from excessive pressure within it, which may be caused by the passage of the exhaust into it, thus enabling the engine to make steam more freely, and also to effect the separation of such smoke as has been forced into the drum from the sparks which have come with it through the passages *a* by allowing the delivery of this smoke through the perforations of the drum *G* into the space *G'*, whence it may escape upward, as before described. The motion of the sparks while descending into the flues *I* has been before described. The sparks which have collected in the space *G'* are not allowed to accumulate there, so as to render it necessary to draw them off by outward spark-spouts, but they are driven through the passages *H* and their corresponding draft-pipe openings into the draft-pipe, and are then thrown upward again and against the lower surface of the cone, as at first. The spouts *F'* and the pipes *F''*, placed on each side of the longitudinal central line of the engine, serve to deliver a concentrated blast or jet from each exhaust of the engine into the passages *A* and into the flues *I*, so as to produce a partial vacuum therein, thus causing a suction or draft in the said passages *A* and the flues *I*, so as to more rapidly and easily force the sparks into them from the drum *G*. The arrangement of the slanting passages *d* in the platform *F* gives a whirling or spiral motion to the draft.

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

1. In a spark-arrester, the combination, with a draft-pipe, of a cone having vertical radial

passages and horizontal radial passages, and of a cover the undersurface of which is shaped like an inverted cone, substantially as herein shown and described.

2. In a spark-arrester, the combination of a smoke-stack and a draft-pipe with a cone opening into a perforated drum, which forms spaces between the draft-pipe and the outer shell of the smoke-stack, and of a supporting-ring provided with tubes which lead into the draft-pipe, substantially as herein shown and described.

3. In a spark-arrester, the combination, with a saddle and a draft-pipe, of a cone having vertical radial passages, two of which open into funnels provided with downwardly extending pipes for the delivery of a concentrated blast from the exhaust into the saddle, substantially as herein shown and described.

4. In a spark-arrester, the combination of a smoke-stack and a draft-pipe with a cone supported on a platform extending entirely around the flaring side of the smoke-stack, and having inclined or screw-like openings within and around its outer circumference, in order to give a whirling or a spiral motion to the draft, substantially as herein shown and described.

5. In a spark-arrester, the saddle *A*, the smoke-stack *B*, and the draft-pipe *D*, in combination with the cone *E*, having the apertures *a* and *b*, and the cover *E'*, the platform *F*, having the openings *d*, the drum *G*, and the ring *H*, substantially as herein shown and described.

6. The saddle *A*, the pipes *I*, the smoke-stack *B*, and the draft-pipe *D*, in combination with the cone *E*, the platform *F*, the funnels *F'*, the pipes *F''*, the drum *G*, and the ring *H*, substantially as herein shown and described.

7. The saddle *A*, having the passages *A'*, provided with an inclined bottom, *A''*, and the pipes *I*, in combination with the draft-pipe *D*, the cone *E*, and the platform *F*, provided with the funnels *F'* and the pipes *F''*, projecting into the passages *A'*, substantially as herein shown and described.

JOHN COLUMBUS ALBRECHT.

Witnesses:

GEO. C. BATES,
A. O. BLACKMAR.