(No Model.)

2 Sheets—Sheet 1.

C. S. DETRO.

SPARK ARRESTER.

No. 371,179. Patented Oct. 11, 1887.

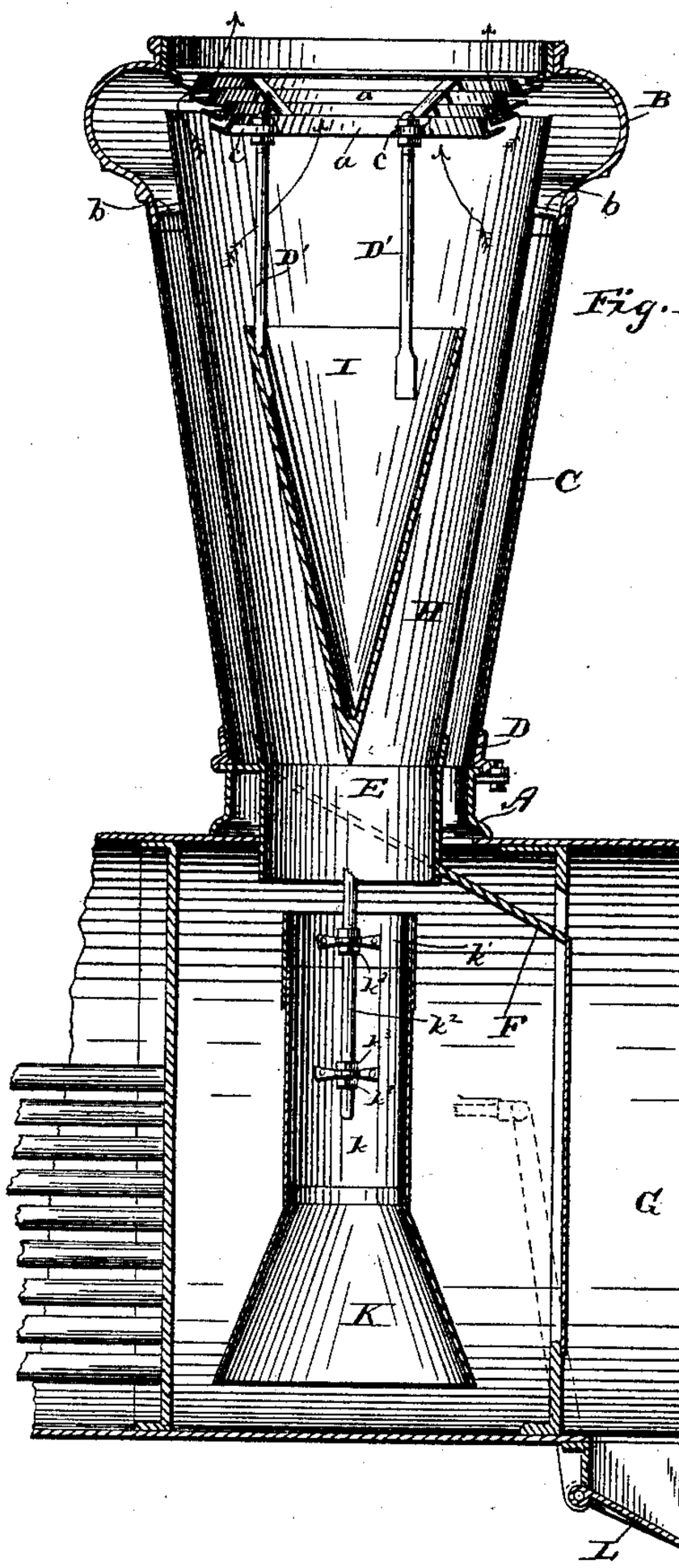


Fig. 1.

Fig. 4.

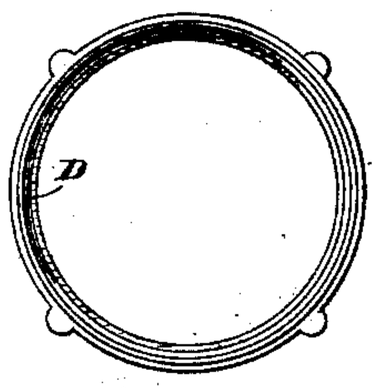


Fig. 5.

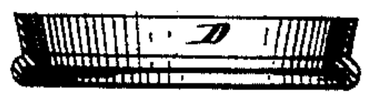
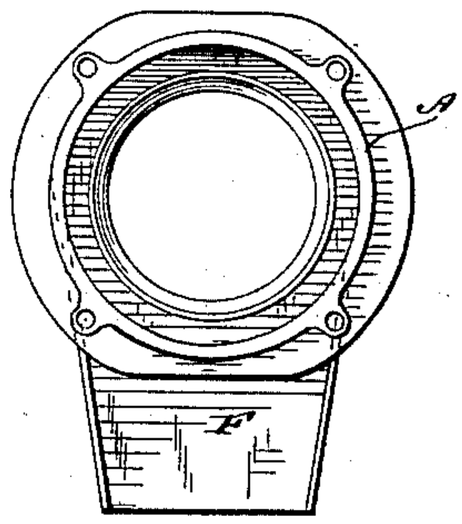


Fig. 6.



Witnesses.
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(No Model.) 2 Sheets—Sheet 2.

C. S. DETRO.

SPARK ARRESTER.

No. 371,179. Patented Oct. 11, 1887.

Fig. 2.

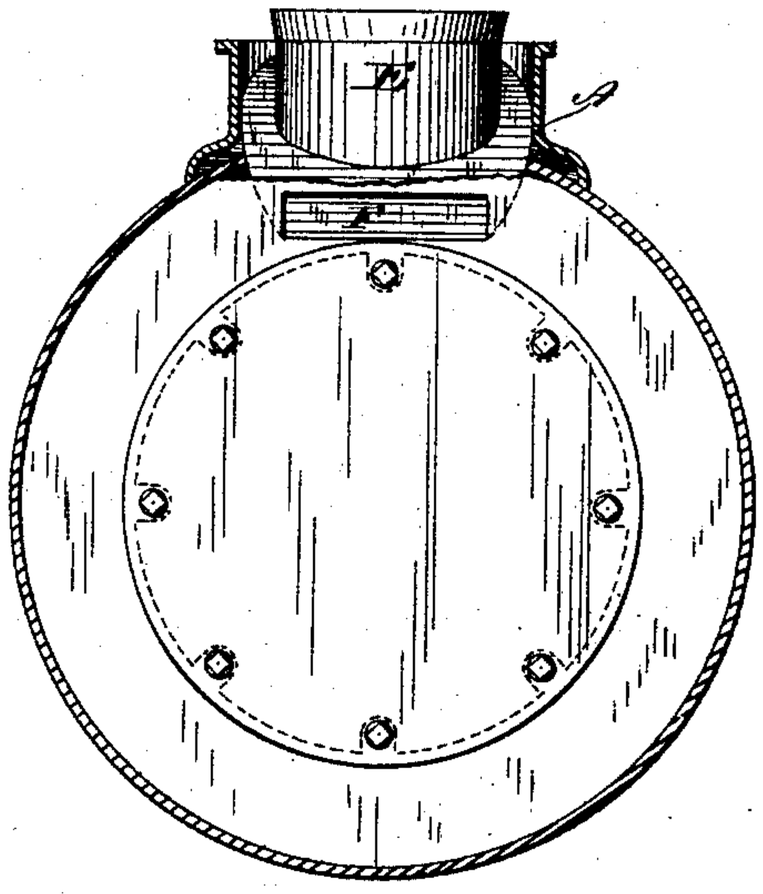
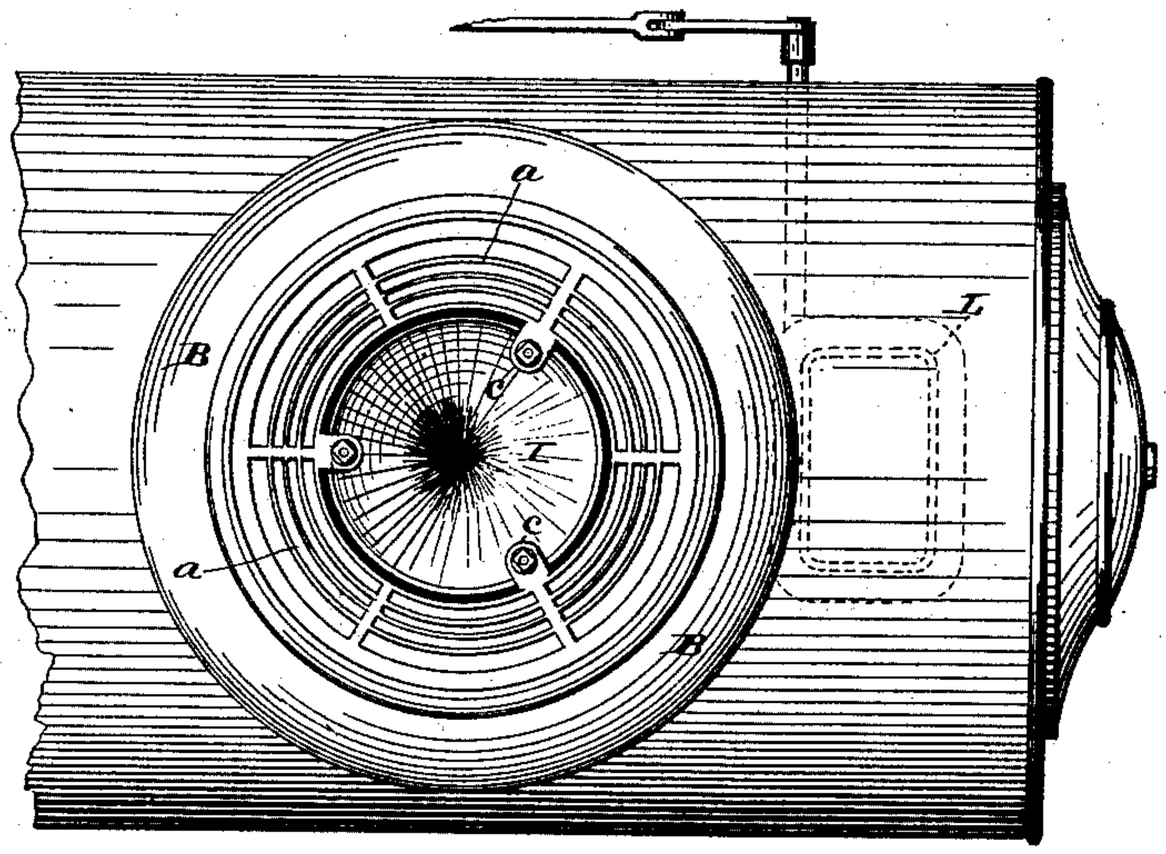


Fig. 3.



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UNITED STATES PATENT OFFICE.

CLARANCE S. DETRO, OF ASHLEY, PENNSYLVANIA.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 371,179, dated October 11, 1887.

Application filed June 29, 1887. Serial No. 242,904. (No model.)

To all whom it may concern:

Be it known that I, CLARANCE S. DETRO, of Ashley, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Spark-Arresters; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

This invention has for its object to improve the construction of and render more efficient that class of spark-arresters more particularly adapted for application to locomotive smoke-stacks, although it may be applied to other classes of furnaces and engines with good results; and to this end the said invention consists in certain combinations of parts and details of construction, to be hereinafter described, and pointed out particularly in the claims at the end of this specification.

Referring to the accompanying drawings, Figure 1 is a section of a spark arrester as applied to a locomotive, showing the front tube-sheet and extended front. Fig. 2 is a front elevation of the same, the end of the extended front being removed and the smoke-stack broken away. Fig. 3 is a top plan view. Figs. 4 and 5 are views of the cast ring which is bolted to the base and supports the outer casing. Fig. 6 is a top plan view of the base-section.

Similar letters of reference in the several figures indicate the same parts.

The letter A denotes the base of the stack, which is bolted to the boiler-shell or other support. B is the top section, curved, as shown, so as to form a deflector against which the sparks impinge, and which has secured to its inner edge the series of annular deflectors *a*, slightly separated one from the other to allow of the escape of the smoke.

The base and top sections just described are preferably of cast-iron, and are joined together by the sheet-iron casing C, bolted to the top section and to a cast-iron ring, D, at the bottom, which is in turn bolted to the base-section A.

The base A is cast with the central depending portion, E, forming the lower extension of the smoke-stack, and around which passes the chute F, preferably inclined from rear to front, as shown, and extending forward and opening into the extended front G. The central depending portion, E, is flared slightly outward at the top, and serves as a seat for the inner casing, H, which extends up parallel with the outer casing to within a short distance of the top section, B, as shown, and is held from longitudinal movement at the top by braces *b*. These braces *b* are preferably short pieces of tubing interposed between the two casings and having rivets or bolts passing through them and through the top section and inner and outer casings, thereby holding all three parts firmly in their proper relative positions.

The deflectors *a* are preferably made of cast-iron, and the innermost one has three or more lugs or ears, *c*, located thereon for supporting the rods D′, which sustain the conical deflector I.

Located within the smoke-box is the uptake, consisting of the lower conical shaped part, K, having the upper tubular part, *k*, and a movable section, *k′*. The lower part may or may not be stationary, as desired, and is connected to the movable section *k′*, which telescopes therewith through screw-threaded rod *k²*, having the adjusting-nuts *k³* thereon for adjusting it nearer to or farther from the mouth of the smoke-stack, for a purpose to be presently explained.

The operation of the arrester will now be readily understood. The smoke and products of combustion passing through the flue-tubes of the boiler into the smoke-box are carried thence up into the smoke-stack, where the solid matter, sparks, &c., impinging upon the conical deflector I, are thrown outward and upward against the deflectors *a* and upper section, B, whence they slide smoothly round the curved surface of the upper section and pass down into the space between the inner and outer casings, the smoke passing out through the central opening and between the deflectors *a*, as shown by the arrows. The draft is supplemented by the exhaust of the cylinders passing into the uptake and thence into the smoke-stack, as will be readily understood by those skilled in the art. The supplemental draft-power exerted by the up-

take may be regulated by adjusting the height of the upper section in relation to the mouth of the smoke-stack, or the lower section with relation to the bottom of the chamber, by means of the supporting-rod and nuts thereon. When found necessary or desirable, the height of the cone I may also be adjusted by unscrewing the nuts on the supporting-rods, adjusting the cone, and again setting the nuts up. After being deflected over into the space between the inner and outer casings, the sparks and other solid particles gravitate downward to the bottom of the said space and slide off down the inclined chute into the extended front or receptacle arranged for their reception.

In my preferred construction I provide the bottom of the forward extension or receptacle with a downwardly-opening door, L, operated by means of the lever M and rod N, running back to the cab, whereby the said receptacle may be emptied very conveniently by the fireman while at his post in the cab.

It is obvious that there may be a greater or less number of deflectors *a*, or they may extend downward into a longer frustum of a cone than is shown in the drawings, or they may form a complete cone and cover the entire opening in the stack.

Having thus described my invention, what I claim as new is—

1. In a spark-arrester, the combination, with the smoke-stack and conical deflector located therein, of the series of annular deflectors and the curved deflector at the top, and the downwardly-extending spark passage and chute, substantially as described.

2. In a spark-arrester, the combination, with the smoke stack having the conical deflector located therein and the curved deflector and series of annular deflectors at the top, of the casing for said smoke-stack, forming the downward passage for the sparks, and the inclined chute passing around said stack at the bottom and emptying into the extended front or other receptacle, substantially as described.

3. In a spark-arrester, the combination, with the smoke-stack, the outer casing forming the downward passage for the sparks, and the curved deflector at the top, of the vertically-adjustable conical deflector located within the smoke-stack, substantially as described.

4. In a spark-arrester, and in combination with the inner and outer casings forming the smoke-stack and downward passage for the sparks and the curved deflector at the top, the conical deflector located within the smoke-stack and the uptake located in the smoke-box, having its upper section adjustable with relation to the mouth of the smoke-stack, as set forth.

5. In a spark-arrester, the combination, with the base-section, the inner and outer casings supported thereby, and the curved deflector at the top supporting the conical deflector within the inner casing, of the braces or bolts passing through both the inner and outer casings and curved deflector for maintaining the parts in their proper relative positions at the top, substantially as described.

6. In a spark-arrester, the combination, with the inner and outer casings, as described, forming the down passage for the sparks, of the base-section having the central depending portion forming the mouth of the smoke-stack, and the inclined passage or chute passing around said central or depending portion, substantially as described.

CLARANCE S. DETRO.

Witnesses:
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