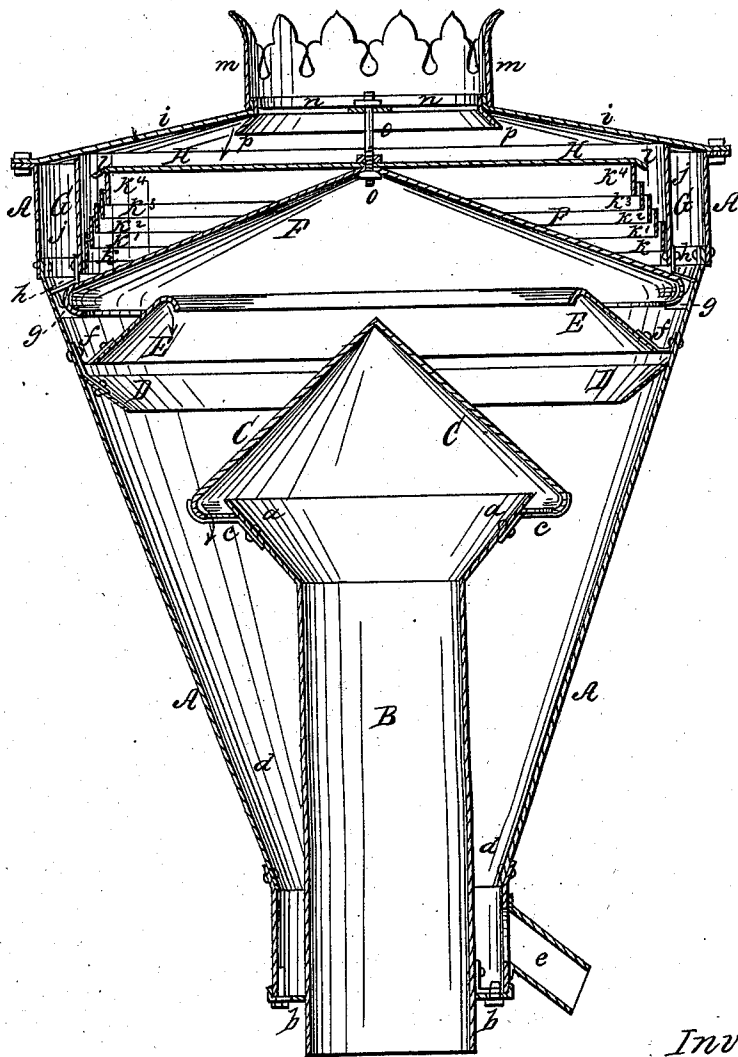


J. A. W. Justi,
Spark Arrester,
No 83,506. Patented Oct. 27, 1868.



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J. A. W. JUSTI, OF SAVANNAH, GEORGIA.

Letters Patent No. 83,506, dated October 27, 1868.

IMPROVEMENT IN SMOKE-STACKS FOR LOCOMOTIVES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, J. A. W. JUSTI, of Savannah, in the county of Chatham, and State of Georgia, have invented a new and useful Improvement in Locomotive Smoke-Stacks; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which the drawing represents a sectional elevation of my improved locomotive smoke-stack.

The object of this invention is to provide a locomotive smoke-stack with such detaining-devices, that no coal, cinders, or sparks can pass through it with the escaping smoke, while the draught is not in the least impeded.

The invention consists in the arrangement of the aforesaid detaining-devices, and more particularly in an annular grate, which will most effectually prevent sparks from passing upward through the chimney.

A, in the drawing, represents the outer sheet-metal shell of a locomotive, said shell being of ordinary or suitable form and size, and secured in a suitable manner to the locomotive.

Through the lower end of the chimney, is fitted a smaller pipe, B, with an enlarged upper end, *a*, as shown.

This inner pipe extends upward, somewhat above the middle of the chimney, and reaches also below the lower end of the same. The lower end of the chimney-case A is closed around the pipe B, by an annular plate, *b*.

C is a conical sheet-metal cap, fitted above the pipe B, and secured, by means of brackets *c*, to the same. Its edge is rounded and turned in, as in the drawing, and is about one inch lower than the upper edge of the pipe B.

The object of the cap C is to arrest the cinders and heavy substances that may arise in the smoke-pipe B, and to conduct those that may be carried over the edge of B to the annular space *d*, formed around the lower part of the pipe B, above the plate *b*. From such annular space, the substances may be withdrawn through a pipe, *e*.

D is an annular plate, fastened with its outer, higher edge to the shell A, so as to be in contact with the same, while its inner edge is lower, and is free from contact with any other part of the apparatus.

The plate D will form an arrester or stop for such coal, sparks, or cinders, as may rise in the chimney along the shell A.

E is a sheet-metal ring, inclined also, but in the opposite direction, as D; that is, its lower edge is the outer, and its upper edge the inner one. It is, by means of angle-irons *f f*, fastened to the shell A, above the ring D, as shown, its outer edge being about one inch distant from the shell.

Its upper inner edge is bent downward, to arrest sparks that may be blown up along its lower face, and it is distant from the shell, for the purpose of allowing

heavy substances from above to roll down on it, and on the ring D, to the lower part of the chimney.

F is a conical cap, fitted over and above the ring E, and resting upon brackets *g g*, that project from the shell, as shown. It has its edge turned in, to prevent sparks, &c., from being, by the draught, carried around the edge, and is about one inch distant from the inner side of the shell, as shown.

Upon the cap F rests an upright sheet-metal ring, G, which has angle-irons or feet *h h*, at its lower edge, resting on the cap F, as shown, so that, thereby, the lower edge of the ring G is raised about one inch above the cap. The upper edge of the same ring reaches to and comes in close contact with the annular covering-plate *i* of the shell A.

The ring G is about three or four inches distant from the inner side of the shell, and there is thus a space, *j*, formed around it, which is closed on top and sides, and which is a trap for sparks, &c., to prevent their being blown into the inner side of G.

Near the lower edge is fastened, to the inner side of the ring G, by means of rivets or otherwise, a shorter ring, K, which is about one-sixteenth part of an inch distant from the ring G, and to the inner side of K, is, in a similar manner, fastened another ring K¹, and thus, seven, or more or less, rings K, K¹, K², &c., are arranged, the inner one having its lower edge always a little higher than the one to which it is fastened. The innermost ring, K⁴, is attached to the under side of a plate, H, which has a rim, *l*, projecting beyond K⁴, as shown.

The distance between the various rings K¹, K², &c., is determined by means of washers interposed between them.

Instead of being separate rings, this grate, K¹, &c., can be formed by one narrow band wound spirally in the requisite form, the windings being about one-sixteenth of an inch apart from each other, and gradually rising, as shown. Sparks cannot readily pass through this grating, and if they do, they will be arrested by the projecting flange *l*, or by the cover of the shell.

The covering-plate *i* of the shell has a central aperture, around which an upward-projecting ring, *m*, is arranged. Said ring is made of open-work, as shown, and has its upper part outward bent, to secure an uninterrupted draught.

Across the central aperture of the plate *i*, is fitted a cross, *n*, from which a bolt or screw, *o*, is suspended, for connecting the cap, F, with the plate H, in the manner shown.

Under the plate *i*, projects around the central aperture, downward and outward, an annular plate, *p*, for arresting sparks that may have succeeded in arriving above the plate H.

It will be noticed that it is almost an impossibility for a spark or ashes to issue from the orifice of the smoke-stack, and an actual impossibility for coal or cinders.

Having thus described my invention,

I claim as new, and desire to secure by Letters Patent—

1. The grate formed by the rings K, K', &c., or their equivalent, arranged in the ring G, and under the plate H, substantially as described, and fitted into the smoke-stack of a locomotive, for the purpose of arresting sparks, ashes, &c., as set forth.

2. The combination, within the smoke-stack of a locomotive-engine, of the pipe B, having an enlarged upper end, of the cap C, ring D, deflector E, cap F, ring G, plates K, K', &c., or their equivalents, plate

H, and ring p, all arranged substantially as herein shown and described.

3. The caps C and F, and the ring E, constructed with inward and downward-bent inner edges, substantially as herein shown and described.

J. A. W. JUSTI.

Witnesses:

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