

Weidman, Major & Sample,

Spark Arrester.

No. 110,315.

Patented Dec. 20, 1870.

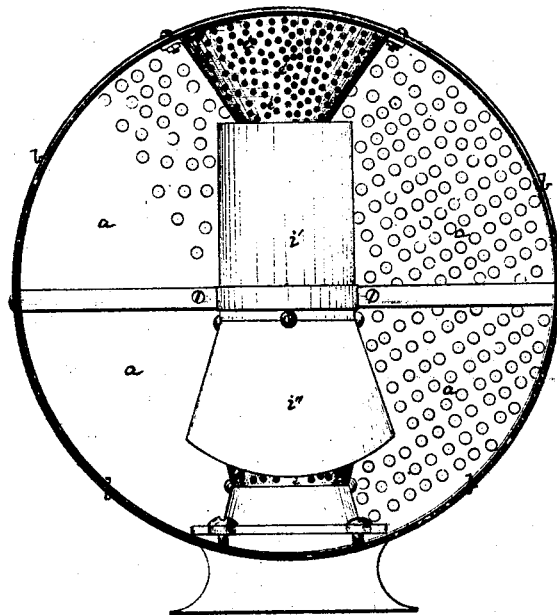


Fig. 1.

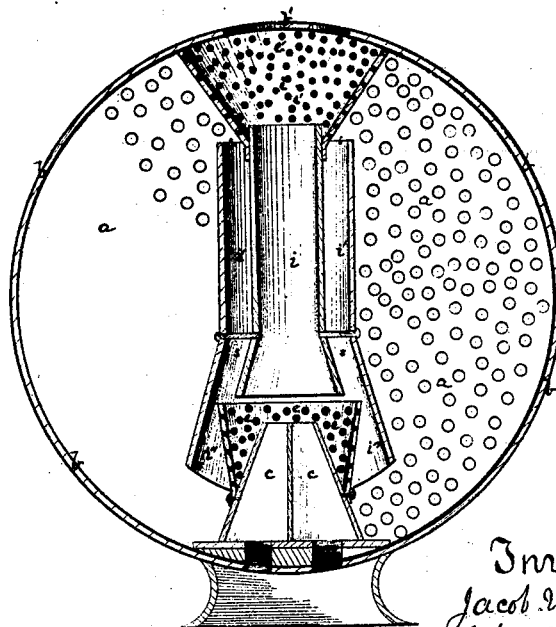


Fig. 2.

Witnesses:

R. B. Wrenshall

John P. Keane

Inventors:

Jacob Weidman,

John Major,

John J. Sample,

by Bakerwell & Knisly,

their Attys.

United States Patent Office.

JACOB WEIDMAN, JOHN MAJOR, AND JOHN J. SAMPLE, OF PITTSBURG,
PENNSYLVANIA.

Letters Patent No. 110,315, dated December 20, 1870.

IMPROVEMENT IN SPARK-ARRESTERS.

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

To all whom it may concern:

Be it known that we, JACOB WEIDMAN, JOHN MAJOR, and JOHN J. SAMPLE, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Double-Cone Spark-Arrester; and we do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 represents a front elevation of the open smoke-chamber of a locomotive-boiler.

Figure 2 is a vertical cross-section thereof, through the axial line of the smoke-pipe.

Like letters of reference indicate like parts in each.

Our improvement relates to the construction and combination of devices for preventing the discharge from locomotive smoke-stacks of live or burning sparks.

The force of the draught, under the effect of the exhaust, it is well known, often carries out from the smoke-stack burning sparks of fire, which, alighting on some combustible object, are frequently a cause of great loss.

To enable others skilled in the art to make and use our improvement, we will proceed to describe its construction and mode of operation.

In the drawing—

a represents the flue sheet;

b, the cylindrical inclosure of the smoke-chamber; and

c c, the steam exhaust-flues, all of the usual or any known construction.

Around the base of the exhaust-flues *c c* we arrange an inverted, finely perforated cone, *l*, somewhat like the perforated frame of an ordinary carbon oil lamp-burner.

From at or near the upper end or base of this inverted cone we commence the imperforate smoke-pipe *i*, which extends up to a similar finely perforated inverted cone, *e*, the base of which latter is fastened to the part *b* just under the stack-opening *v*.

Outside the pipe *i*, and at a little distance from it, is a draught-pipe, *i'*, the lower end of which is funnel-shaped, as at *i''*, and comes down over the joint of the pipe *i* and perforated cone *e*, coming nearly down to the lower end of the cone.

The upper end of it extends up nearly to the upper cone *e*.

The operation of the devices described is then as follows:

The steam, escaping with great force alternately from the exhaust-flues *c c*, creates a strong draught through the boiler-flues from the fire-box.

The direction of the force thus exerted causes the smoke to enter the pipe *i* through the perforations of the cone *e*, and pass up and out at the stack.

The sparks of fire which are drawn through the boiler-flues are thus drawn against the outer face of the cone *e*, but, on account of the fineness of the perforations in the cone, they cannot pass through it.

The draught of smoke and steam up the pipe *i*, and from the smoke-chamber through the upper cone *e*, causes a strong draught up the chamber *s* between the pipes *i* and *i'*.

This carries the sparks up the chambers against the outer face of the upper cone *e*, from which they are thrown off outwardly, to be again carried into the line of the draught, carried against the lower cone *e*, up the chamber *s*, against the cone *e*, and so on continuously until they not only become cold, but, also, are so broken up that they will pass through the perforations of the cones and be carried off as fine dust.

By the use of the central pipe *i* of a moderate diameter, and extending through the greater part of the height of the smoke-chamber, we secure a powerful draught, and by the use of the double-cone arrangement, as set forth, we combine therewith an effective spark-arrester, which will not only prevent the escape of burning sparks, but breaks them up and throws them off when cold.

We also find that by the use of these devices we are enabled to enlarge the discharging apertures of the exhaust-pipes *c c*.

If these apertures are made small they produce a quick sharp draught, which tears up the fire and draws it through the flues.

Our improvement, by concentrating the force of the draught in the pipe *i*, enables us to make the exhaust-pipes *c* larger; and thereby secure an equally powerful but more uniformly-acting draught.

The fire is drawn through less rapidly and a large amount of fuel is accordingly saved.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The imperforate double-pipes *i i'*, arranged in and extending through the greater part of the height of a locomotive smoke-chamber, the inner one being of a uniform, or nearly uniform, diameter, through the greater part of its length, and the chamber *s* between the pipes *i i'*, opening at both ends into the smoke-chamber, substantially as described.

2. The perforated cones *e e'*, one in the upper part and the other in the lower part of a locomotive smoke-chamber, arranged with an imperforate pipe connecting them in the line of draught, the latter being surrounded with one or more draught-pipes *i'*, substantially as described.

In testimony whereof we, the said JACOB WEID-

MAN, JOHN MAJOR, and JOHN J. SAMPLE, have hereunto set our hands.

JACOB WEIDMAN.
JOHN MAJOR.
JOHN J. SAMPLE.

Witnesses:

A. S. NICHOLSON,
THOS. B. KERR.