# T. D. KENDRICK.

## Spark-Arresters.

No. 139,509. Patented June 3, 1873.

*Fig. 2.*

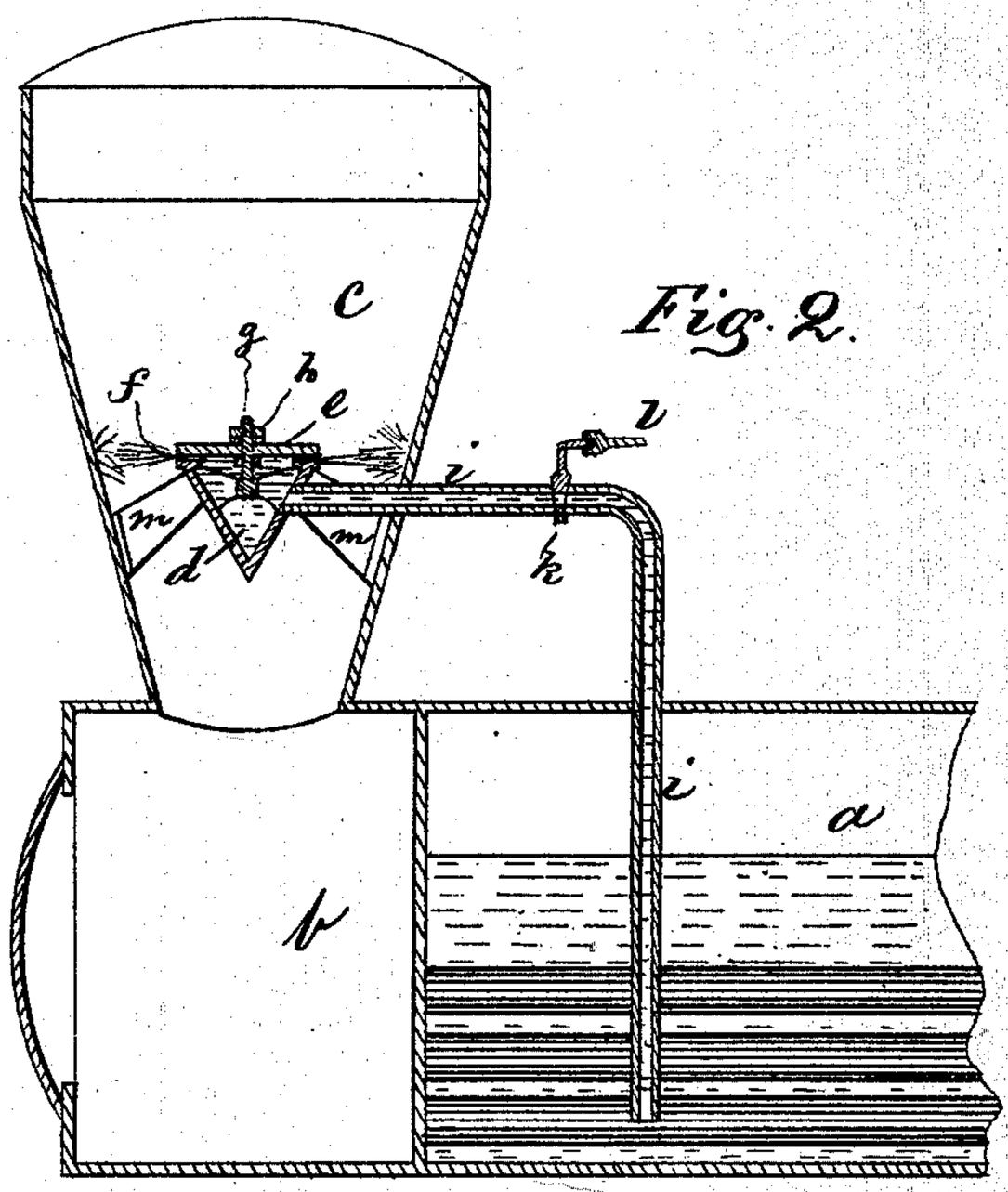
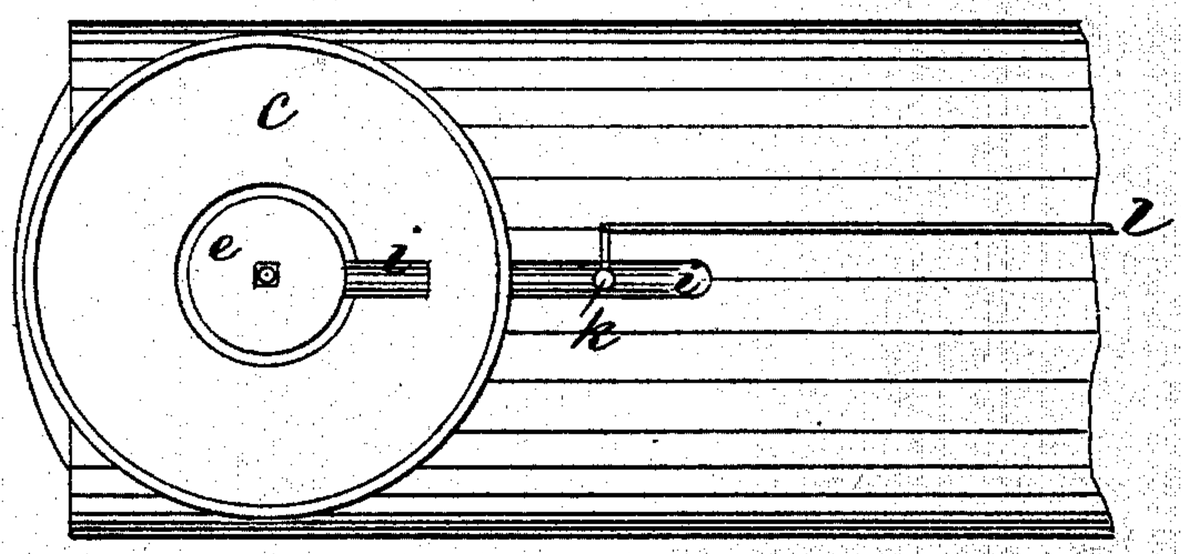



*Fig. 1*




*Witnesses:*

John R. Geard.

James P. Gardner.

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by Munn & Andrew

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# UNITED STATES PATENT OFFICE.

THOMAS D. KENDRICK, OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN SPARK-ARRESTERS.

Specification forming part of Letters Patent No. **139,509**, dated June 3, 1873; application filed March 22, 1873.

*To all whom it may concern:*

Be it known that I, THOMAS D. KENDRICK, of Boston, in the county of Suffolk and State of Massachusetts, 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 invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings which form part of this specification.

My invention relates to a new and useful apparatus for arresting the sparks in a locomotive or other smoke-stack, consisting in a suitable vessel placed somewhere in the center of the smoke-stack, or it may be attached to the inside circumference of the smoke-stack. The said vessel is filled with water of the same pressure as the contents of the boiler. A pipe, provided with a suitable valve or stop-cock, connects the aforesaid vessel in the smoke-stack with the water in the boiler. The water is forced out through a narrow annular opening from the vessel placed in the smoke-stack, and the sparks, ascending upward, are therefore obliged to pass through a thin sheet of water, whereby they are speedily extinguished.

On the drawing, Figure 1 represents a ground plan, and Fig. 2 a central longitudinal section, of a locomotive boiler and smoke-stack.

Similar letters refer to similar parts wherever they occur on the different parts of the drawing.

*a* represents the boiler, and *b* the smoke-chamber. *c* is the smoke-stack, in the usual manner. In the smoke-stack *c* I place the inverted conical vessel *d*, as shown in Fig. 2. The vessel *d* is provided at the top with a cover, or its equivalent, *e*, between which and the upper end of the vessel *d* is left a narrow annular space, *f*, through which the water from the boiler *a* is forced out as a thin sheet all round the narrow opening *f*. The cover *e* may be adjusted so as to increase or decrease the width of the space *f* by means of the screw *g* and nuts *h*, or their equivalents, when required. The conical vessel *d* stands in communication with the water in boiler *a* by means of the connecting-pipe *i*, as shown, provided with a suitable valve or stop-cock, *k*, by which the water from the boiler *a* may be wholly or partially shut off from the vessel *d*, as may be necessary. The cut-off *k* is operated by the engineer by means of the connecting-rod *l*, or its equivalent, as shown in the drawing. The vessel *d* is held firmly in its proper place by means of one or more brackets, *m m*, secured to the inside of the chimney *c*.

The object of making the vessel *d* conical is to prevent the sparks and cinders from cutting and wearing out the lower surface of said vessel *d*, and also for the purpose of conducting the sparks and cinders properly against the sheet of water issuing from the annular space *f*, where the said sparks are speedily extinguished.

I do not confine myself to the exact location of the vessel *d*, as shown in the drawing, as I may place it higher or lower, as may be required, in different kinds of chimneys; or I may place it attached to one side of the chimney instead of in the middle, in which case I would not require a full circular exit, *f*, but only part of a circular opening, large enough so as to cover with a sheet of water the whole passage of the chimney where the said vessel was located.

By means of this simple apparatus I am able to prevent any ignited sparks or cinders from passing by the sheet or spray of water issuing from the opening *f*. When the engine is not running I shut the water off from the vessel *d* by means of the stop-cock *k* and rod *l*, as heretofore described.

What I wish to secure by Letters Patent, and claim, is—

A vessel, *d*, provided with an annular or partial opening, *f*, through which a sheet of water is forced for the purpose of extinguishing sparks and cinders, the said vessel *d* being in communication with the water in the boiler by means of the pipe *i*, stop-cock or cut-off *k*, and rod *l*, as herein set forth and described.

In testimony that I claim the foregoing I have hereunto set my hand this 14th day of March, 1873.

THOMAS D. KENDRICK.

Witnesses:

ALBAN ANDRÉN,

JOHN L. TUCKER.