E. H. HAGGENS.

Improvement in Spark-Arresters for Locomotives.

No. 131,514. Patented Sep. 24, 1872.

Fig. 1

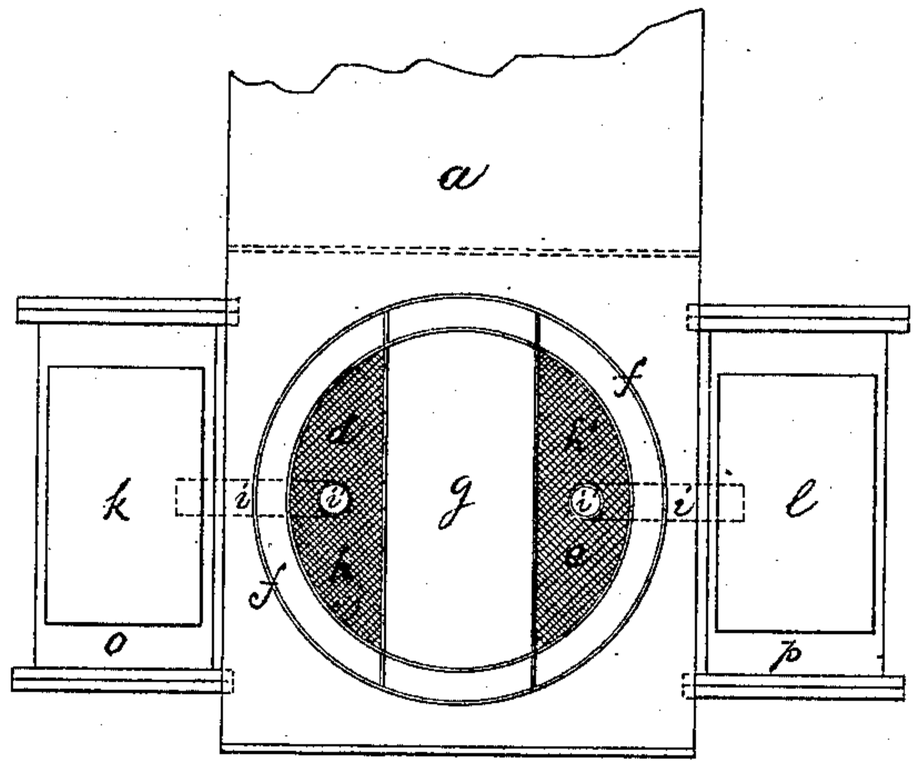
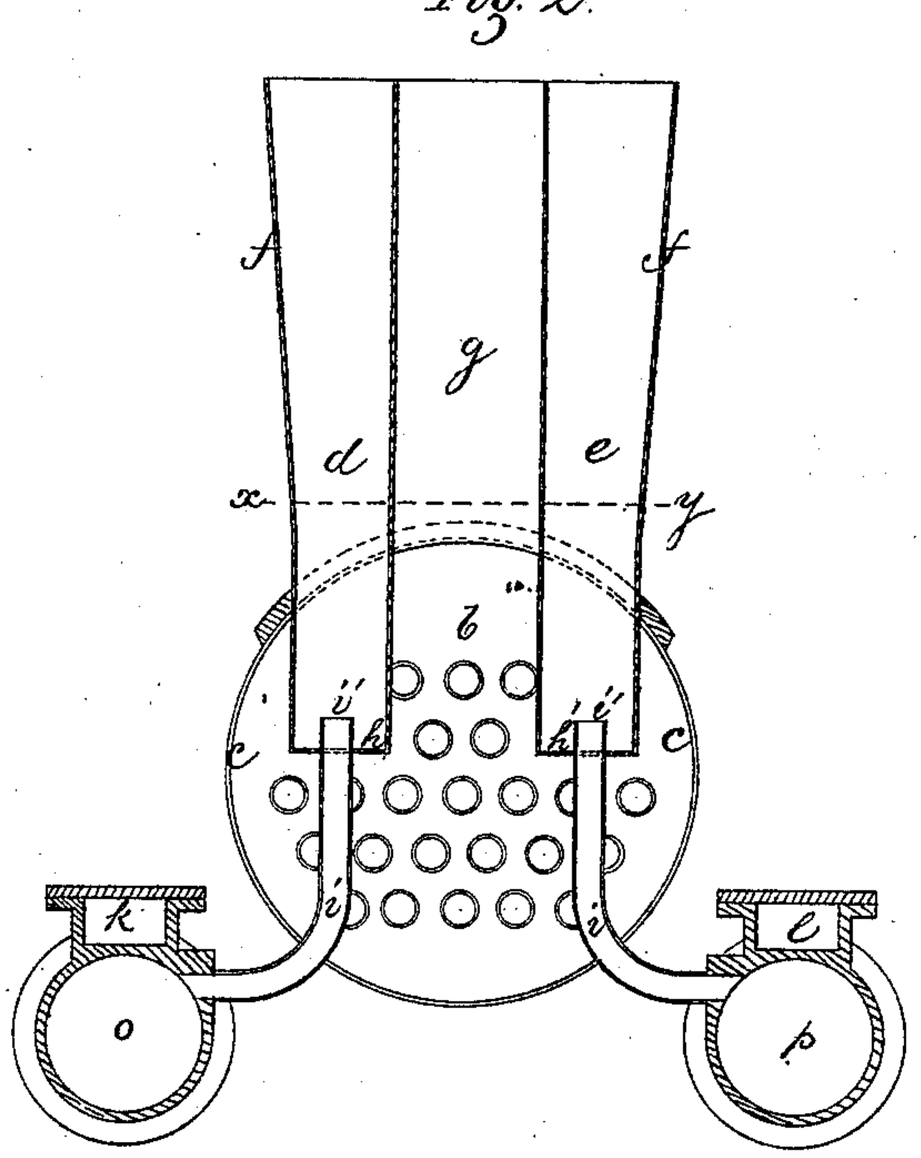


Fig. 2.



Witnesses
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EDMUND H. HAGGENS, OF WOBURN, MASSACHUSETTS.

IMPROVEMENT IN SPARK-ARRESTERS FOR LOCOMOTIVES.

Specification forming part of Letters Patent No. **131,514**, dated September 24, 1872.

To all whom it may concern:

Be it known that I, EDMUND H. HAGGENS, of Woburn, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in Smoke-Stacks of Locomotive-Engines, of which the following is a specification:

Figure 1 of the accompanying drawing is a horizontal section through the line *x y;* and Fig. 2 is a central vertical section of my improved smoke-stack.

The present invention relates to certain new and useful improvements in smoke-stacks of locomotive and other like engines, its principal objects being to increase the draft and to prevent the escape of cinders and fire from the stack.

My improvement consists, mainly, in a smoke-stack, arranged as will be hereinafter more fully described, so as to produce a forced draft on each side of a natural central draft, by conducting the exhaust steam from the cylinders to the side compartments of the smoke-stack, which are extended into the smoke-box and provided with netting, so as to increase the draft and to prevent the cinders and fire being carried up the smoke-stack.

In the drawing, *a* represents the boiler of a locomotive-engine provided with a perforated flue-sheet, *b*, in front of which is formed the smoke-box or arch *c*, into which at the top extend the lower portions of segmental chambers or exhaust-flues *d* and *e*, which extend upward into the smoke-stack *f f*, leaving a central or natural flue, *g*, between them. The bottoms of the exhaust-flues *d* and *e* are provided with suitable netting *h h'*, and extending a little above them are the ends *i' i'* of exhaust-pipes *i i*, that connect with the steam-cylinders *o p*, which are provided with steam-chests *k l*.

The operation of my invention is as follows: The smoke and cinders, &c., passing through the flue-sheet *b* enter the smoke-box or arch *c*, where, by the natural draft, the smoke is carried up the central flue *g*, while the cinders and fire are prevented from passing out of the smoke-stack *f f* on account of the insufficiency of the central draft, and their escape through the side or exhaust-flues *d* and *e* is rendered impossible by the netting *h h'* which covers the bottom of the said flues; and by the vacuum which is created alternately in each of the exhaust-flues *d* or *e*, as the steam is exhausted from one of the exhaust-flues *d* or *e* and admitted to the other through the exhaust-pipes *i i*, connecting with the steam-cylinders *o p*, a better draft is produced. Reference being had to the drawing it will readily be seen that the ordinary cone in the top of the smoke-stack is, by my improvement, removed, thus insuring a larger natural draft; and that by admitting the exhaust steam into the side or exhaust-chambers *d* and *e* a forced draft is produced sufficiently powerful to carry off any smoke and yet prevent the escape of any cinders, &c., from the smoke-stack. Instead of dividing the smoke-stack into three compartments, as herein described and represented, two compartments, provided with suitable means for the admission of the exhaust steam, may be used, and the central flue dispensed with.

Having thus fully described my improvements, what I claim as my invention, and desire to have secured to me by Letters Patent, is—

1. The segmental chambers or exhaust-flues *d* and *e*, arranged as shown, and provided with netting *h h'* and pipes *i i*, substantially as specified.

2. The combination of the boiler *a*, exhaust-flues *d* and *e*, smoke-stack *f f*, exhaust-pipes *i i*, and steam-cylinders *o p*, arranged and operating substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDMUND H. HAGGENS.

Witnesses:

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CARROLL D. WRIGHT.