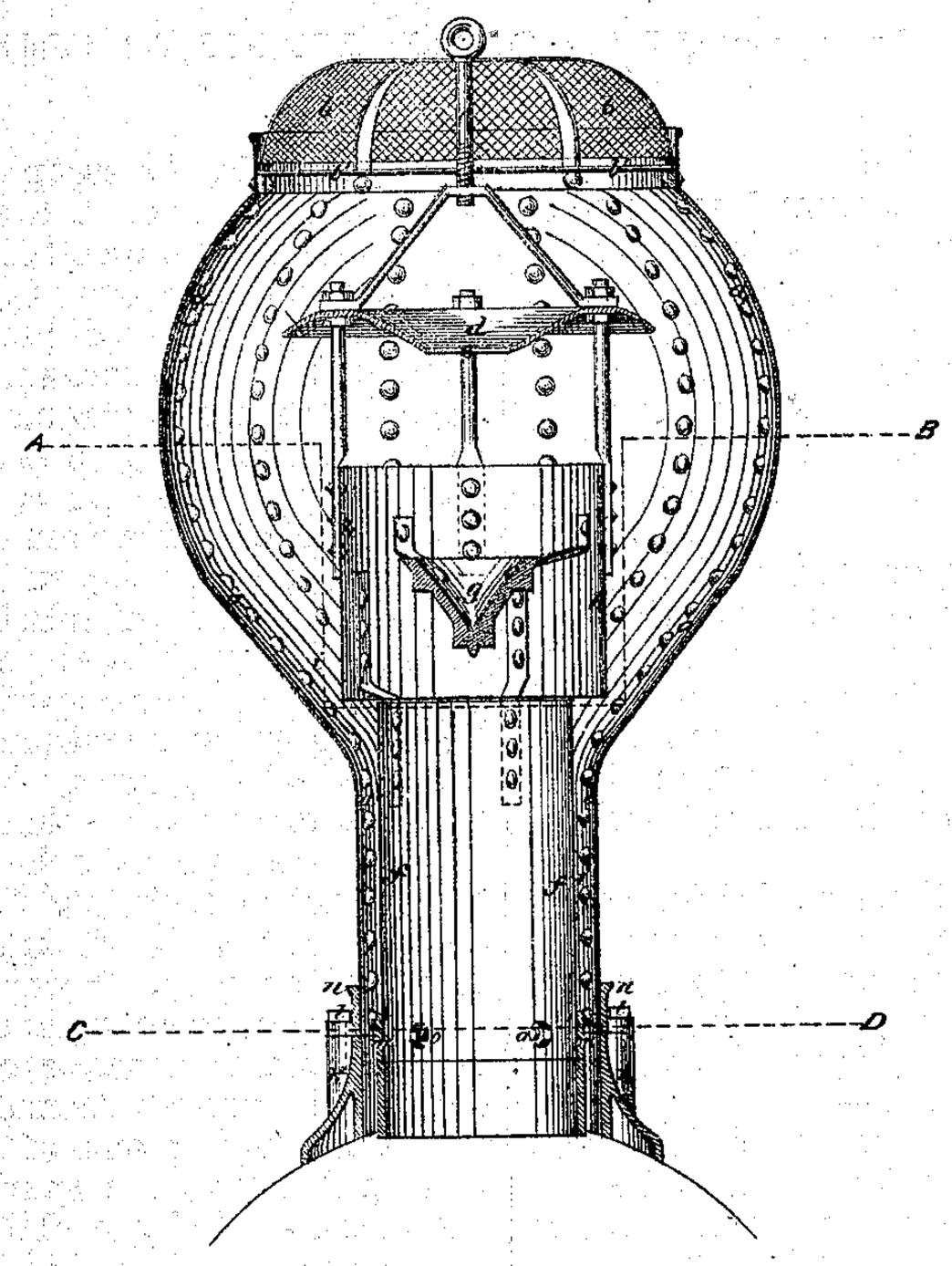
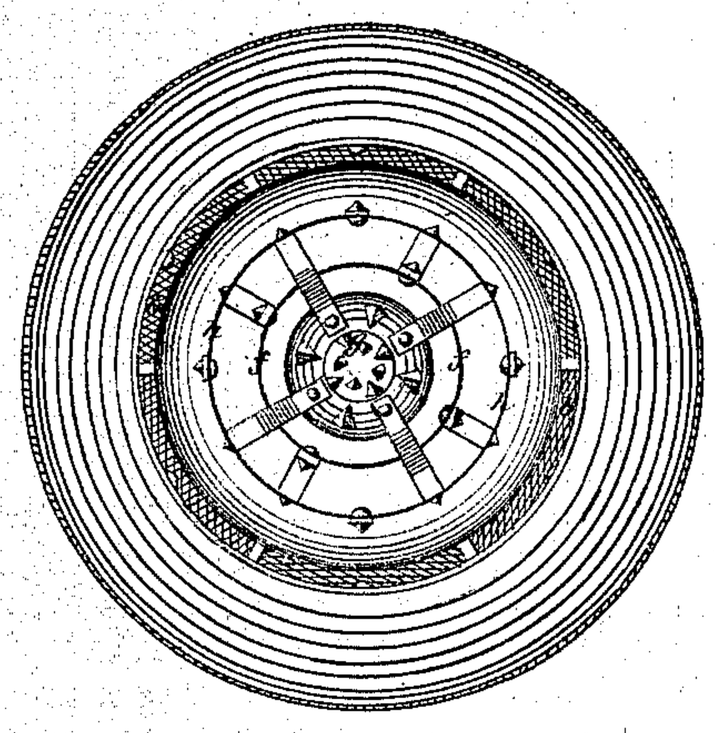
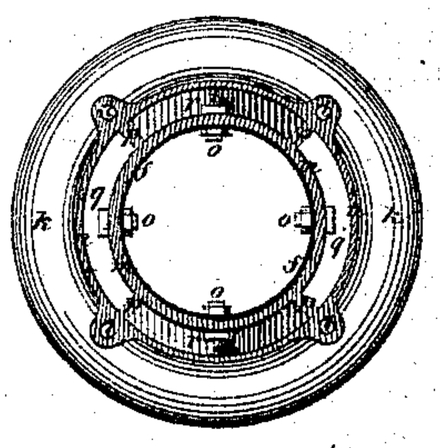
E. REHLING.

Spark-Arresters.

No. 129,863. Patented July 23, 1872.







12" 9" 6" 3" 0 1 2. 3 Feet

Witnesses.
C. H. Poole.
A. Finsmore

Inventor.
Ernst Rehling
Per F. McC. Perkins, Atty.

UNITED STATES PATENT OFFICE.

ERNST REHLING, OF FORT WAYNE, INDIANA.

IMPROVEMENT IN SPARK-ARRESTERS.

Specification forming part of Letters Patent No. **129,863**, dated July 23, 1872.

To all whom it may concern:

Be it known that I, ERNST REHLING, of Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in Smoke-Stacks for Locomotives; and do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon.

The object of my invention is to direct and collect the sparks emanating from the fire-place of the locomotives into the smoke-stack; and to this end it consists in the construction and arrangement of the interior parts of the smoke-stack with the peculiar form or shape of the stack itself, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, which forms a part of this specification, and in which—

Figure 1 is a vertical section of the stack. Fig. 2 is a horizontal section through the line A B of Fig. 1, looking upward; and Fig. 3 is a similar section through C D, Fig. 1, looking downward.

a represents the smoke-stack proper, constructed as shown, the lower part being cylindrical and the upper part bulged out all around, and then contracted again at the top, the whole interior surface being smooth, without any angles or sharp corners, thus forming no obstacle or lodging place for the sparks, but gives a perfectly-smooth channel for the sparks falling back. The upper end of the smoke-stack is covered by a filigrain bonnet, *b*, constructed substantially in the form shown in Fig. 1. This form of bonnet is, however, only intended to be used when burning wood; when coal is used as fuel then the bonnet should be almost if not quite flat. The bonnet, of whatever form used, is fastened to the smoke-stack by a screw, *c*, going through the same and into a brace extending upward from a circular concave casting, *d*, said screw thus at the same time holding this casting in position. This casting is provided with a center hole, *e*, so as to give the required draught for the escape of steam, and is itself intended to form an obstacle for the escaping sparks of coal or wood from the fire. The sparks after leaving the fire-place are received by a hollow cylinder, *f*, within the lower cylindrical part of the stack *a*, in which cylinder the sparks make their way and are thrown against a reversed conical casting, *g*, arranged above the cylinder *f*. This casting is provided with numerous sharp projections *s*, against which the sparks are further broken apart. This reversed cone or casting *g* is, by suitable arms, attached to the inside of another hollow cylinder, *h*, connected with and placed on top of the cylinder *f*, against which the sparks are thrown after having been in connection with the cone *g*. The sparks being thrown against the inside of the cylinder *h* prevents them from being thrown against the smoke-stack itself, which would soon wear the stack out. This cylinder should be of considerable thickness—say about one-fourth of an inch. From the cylinder *h* the sparks are thrown against the above-mentioned circular concave casting *d*, which is connected by rods with and a suitable distance above the upper end of the cylinder. The casting *d* throws the sparks back down into the smoke-arch by a channel, *i*, formed between the cylinders *f* and *h* and the smoke-stack *a*, thereby preventing the rising sparks from interfering with those falling back. This also insures the complete consumption of the sparks, while the center hole *e* allows of the necessary draught for the escape of the steam. The entire smoke-stack with these interior devices is attached to a saddle-piece, *k*, sitting upon the smoke-arch, by means of screws *l*, so that the whole can be taken off if required, leaving only the saddle-piece on the smoke-arch. The lower end of the cylinder *f* and of the smoke-stack *a* are strengthened by cast-iron rings *m* and *n*, respectively. The ring *n* is riveted to the smoke-stack, while the ring *m* is attached to the cylinder *f* by means of bolts *o*. The two rings *m n* are connected by four ribs *p*, dividing the channel *i* into four parts. The saddle-piece *k*, to which these rings are attached, has two apertures, *q*, corresponding with two parts of the above channel, lying opposite to each other. It also contains two saddles, *r*, corresponding with the other two parts of the channel, from which the sparks, as they fall back, are directed to both sides

through the two apertures *q*, thereby collecting them only in two heaps.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the cylinders *f* and *h*, the latter having the interior conical casting *g*, with projections *s*, and the cylinders arranged within the smoke-stack *a* to form the channel *i*, substantially as and for the purposes herein set forth.

2. The combination of the cylinders *f* and *h*, reversed cone *g* with projections *s*, and circular conical casting *d* with center hole *e*, all constructed and arranged substantially as and for the purposes herein set forth.

3. The saddle-piece *k*, provided with two apertures, *q*, and the two saddles *r*, substantially as and for the purposes herein set forth.

4. The combination of the stack *a* having an entire smooth inner surface, cylinders *f h*, castings *d g*, rings *m n* with ribs *p*, and the saddle-piece *k*, all constructed and arranged substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 16th day of May, 1872.

ERNST REHLING.

Witnesses:

HENRY REHLING,

PERTER KESTEL.