(No Model.)

F. GORDON.

SPARK ARRESTER.

No. 336,311. Patented Feb. 16, 1886.

Fig. 2.

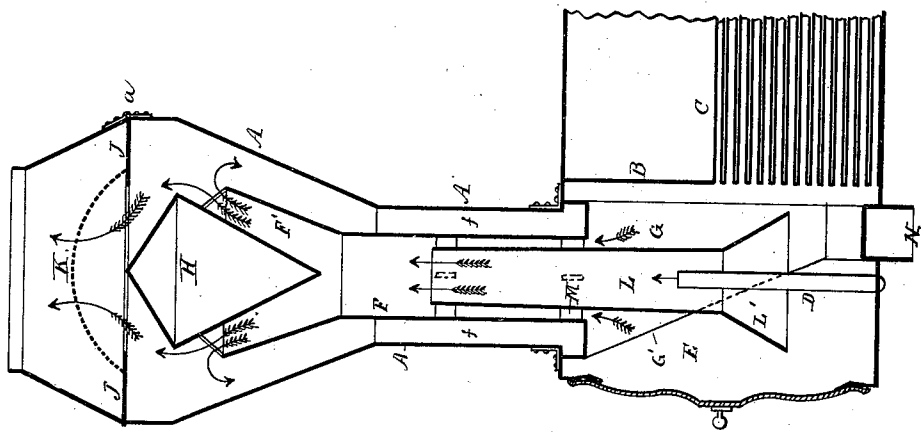


Fig. 1.

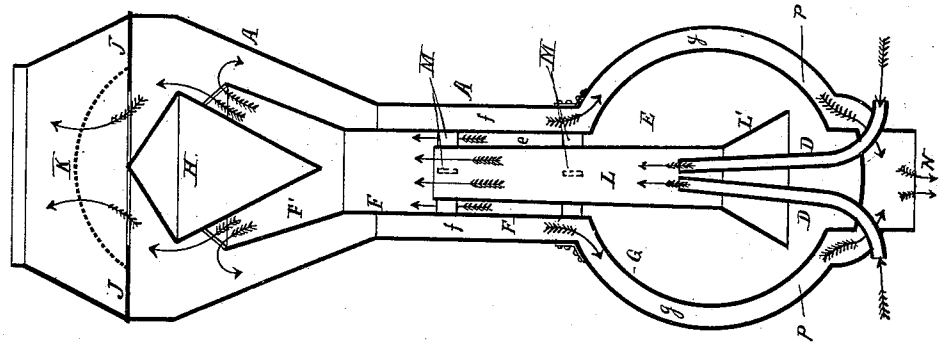
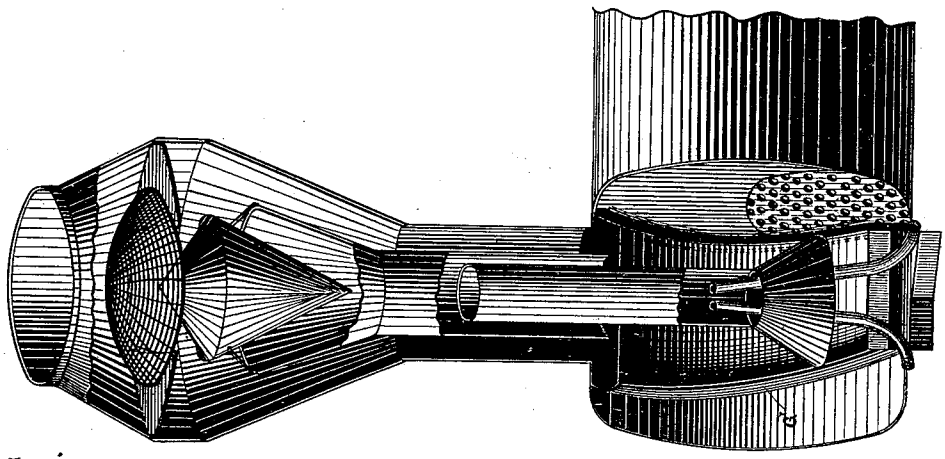


Fig. 3.



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UNITED STATES PATENT OFFICE.

FRED GORDON, OF SIOUX FALLS, DAKOTA TERRITORY.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 336,311, dated February 16, 1886.

Application filed May 12, 1885. Serial No. 165,194. (No model.)

To all whom it may concern:

Be it known that I, FRED GORDON, a citizen of the United States, residing in Sioux Falls, in the county of Minnehaha and Territory of Dakota, have invented a new and useful Improvement in Spark-Arresters for High-Pressure Engines and Locomotives, of which the following is a specification.

This invention relates to means for arresting the sparks and preventing the same from being carried out of the stack by the draft, and for conveying the same downward to be discharged at a point below, in case of a railroad locomotive engine such discharge of sparks and cinders being down upon the road-bed, where, when sufficiently accumulated, they may serve as ballast.

The invention consists in the combination, with a stack of proper shape, of certain interior air-passages, a double cone, a descending chute, and a wire netting, in conjunction with other parts and features more particularly hereinafter described, whereby the desired result is attained, as will be presently more fully set forth.

In the accompanying drawings, which form a part of this specification, Figure 1 is a cross-sectional view of a locomotive smoke-stack, smoke-arch, &c., exhibiting my improved construction. Fig. 2 is a similar section taken in a plane at right angles to the general plane of the section shown in Fig. 1. Fig. 3 is a broken-away perspective view of the same.

The parts cut by the section in Figs. 1 and 2 are for the most part indicated by heavy black lines. The arrows marked upon said figures show the direction of the currents.

Like letters of reference denote the same parts in the several figures wherever used.

In the said drawings A represents a locomotive smoke-stack of the ordinary form quite commonly used. B is the forward flue-sheet; C, the flues; D D, the exhaust-pipes, and E, the smoke arch or space in front of the flues and communicating with the stack.

Within the smoke-stack A, I place an interior shell, F, connected to a shell, G, in such manner that a passage-way, *f*, is left between the shell and the stack, and a passage-way, *g*, is left between the shell and the boiler-covering extension. The upper end of the shell or pipe F is expanded to conform to the shape of the stack in some measure, and over this expanded upper end, F′, is suspended a double cone, H, supported, preferably, by braces *h* from the shell or pipe F F′. Just above the double cone, and consequently at the largest part of the stack, is an annular plate or diaphragm, J, furnished with a central aperture, covered by a dome, K, of wire-netting. The upper part of the stack carrying this diaphragm and netting is hinged at *a* to the lower part of the same, to afford ready access to the interior of the stack below the diaphragm and netting. A petticoat-pipe, L, with flaring bottom L′, extends from the interior pipe or shell, F, down over the ends of the exhaust-nozzles D D. The upper portion of this pipe L is made sufficiently less in diameter to the pipe or shell F so that a passage-way, *e*, is left between the two pipes. Through this passage-way *e* the natural draft of the stack on its way from the flues is at all times free to take its course, while the blast from the exhaust-pipes will upon occasion cause a strong upward current through the petticoat-pipe, and by that means also through the passage-way *e*. The petticoat-pipe is kept in position within and parallel to the pipe or shell F by the guides M, attached to the former, and is constructed to be pushed up and down relatively to said pipe or shell F, to increase or diminish the force of the draft.

The forward portion of the shell G is beveled away or inclined toward the rear to an opening or outlet, N, so that cinders and sparks entering the cavity *g*, enclosed by the shell into which they fall, will flow down and out of the outlet.

A hand-hole for the purpose of giving access to the cavity *g* at its lower part, and which it is inconvenient to show on the drawings, is located at each side of the shell G in the annular portion G′, at about the position indicated by the letter P.

The operation is briefly as follows: The exhaust-steam and the currents thereby created pass up against the lower part of the double cone, which causes a lateral divergence. The cinders and sparks fall into the space *f*, and pass down through space *g*, and discharge at the outlet N, thus avoiding the necessity of cleaning out the smoke-arch at each trip. If any cinders or sparks pass above the cone,

they will be arrested by the netting K or diaphragm J, and fall either directly into the space *f* or upon the upper part of the cone, and thence into said space.

I am well aware that previous to my invention locomotive spark-arresters have been patented which show the combination, with the smoke-stack, of a suspended cone in the upper portion of the stack for the purpose of diverging the current, and pipes and conduits for carrying the cinders which fall from the current so diverged to the ground or lower part of the boiler, and such devices I do not claim to have invented, broadly.

Having thus described my invention, I claim—

The combination of the smoke-stack provided with a suspended cone having an upper and lower conical surface, the same being located in the enlarged portion of the stack, a domed netting placed above the cone and having an imperforate exterior annular flange, a continuous shell within the stack surrounding by its expanded upper portion the conical deflector, and forming with the stack an annular cinder-space, communicating at its lower part with an annular space formed by an inner shell, and the boiler-extension, which cinder-space has an exit for the cinders at its lower part, substantially as specified.

FRED GORDON.

Witnesses:
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