(No Model.)

J. H. OPTENBERG.

SPARK ARRESTER.

No. 263,569. Patented Aug. 29, 1882.

Fig. 2.

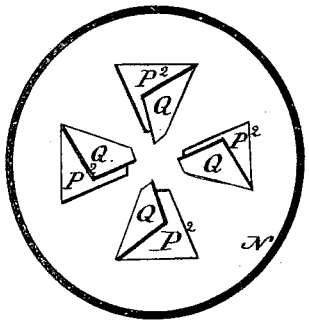


Fig. 1.

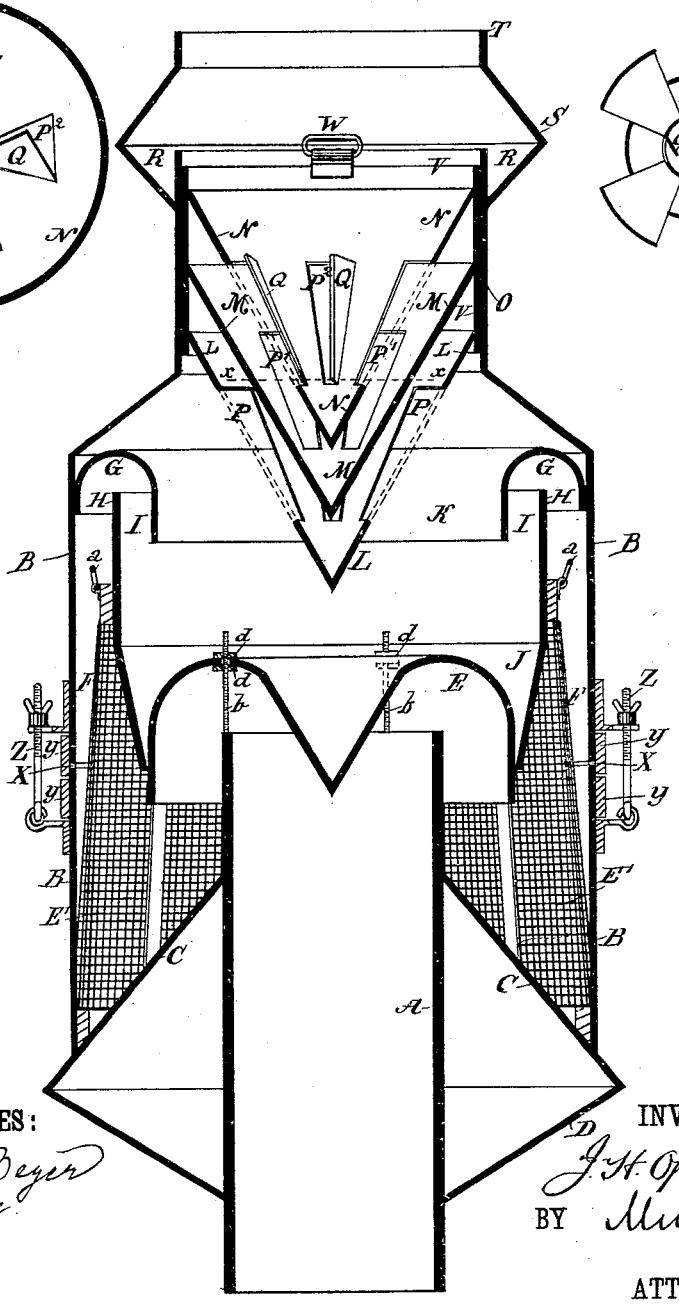
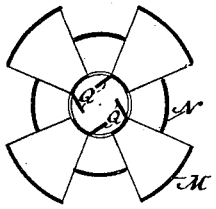


Fig. 3.



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JOHN H. OPTENBERG, OF OSHKOSH, WISCONSIN.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 263,569, dated August 29, 1882.

Application filed April 21, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. OPTENBERG, of Oshkosh, in the county of Winnebago and State of Wisconsin, have invented a new and Improved Spark-Arrester, of which the following is a full, clear, and exact description.

This invention consists of an arrangement of a wire-screen guard, deflectors, pockets, and draft-regulators, as hereinafter more fully described, the object of which is to more effectually prevent the escape of sparks from the smoke-pipe of a locomotive or other boiler-furnace, especially when artificial draft is employed to accelerate the combustion.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional elevation of a smoke-pipe with spark-arresting apparatus arranged according to my invention. Fig. 2 is a top view of the uppermost deflector and draft-regulator, and Fig. 3 is a section on line *x x* of Fig. 1.

A represents the smoke-pipe, around which the jacket B for the case or shell of the spark-arrester is fitted on a conical bottom, C, which is supported by the inverted funnel-shaped base D, attached to the smoke-pipe.

E represents the first deflector. It is located over the top of the smoke-pipe to throw the sparks down on the conical bottom C, where they are confined by the wire-gauze guard E′, extending from said bottom to the lower part of the curb H, inclosing the space over deflector E, the said wire guard being a wire ring or band of wire as large at the base as the jacket B, but tapering upward to the said curb H. The strong currents of the draft project the sparks from the conical base C against the guard E′, by which they are broken and thrown back, to be returned and repeatedly thrust from one to the other, and thus so reduced in size that when they do escape through the meshes of the wire they are too small to retain much fire, if not wholly extinguished. By making the guard E′ the full size of the inside of the jacket B at the bottom and fitting it so that no space exists between it and said jacket the sparks are prevented from being thrust directly through said wire guard and compelled to take the upward course inside of the wire, and thus impinge obliquely upon it in a manner highly favorable to destruction of the sparks. The taper form of the guard E′ favors the disintegrating process by causing the sparks to be thrust against it more by the upward currents than they would if it were vertical. The projections of the interwoven wires also favor the destruction of the sparks in this manner; but in order to render it still more effective I propose to corrugate the web, or use webs woven in corrugated or similar forms. The fine sparks and cinders finally escaping through guard E′ encounter another deflector, G, over said wire guard, by which they are thrust down into the larger dead-air space J, over deflector E, where they are subjected to another grinding process by circulating about until they become light enough to pass off with the smoke. The smoke ascends through passage K from said space J to the inverted hollow cones L, M, and N, nested together, but at suitable distances apart, one above another, and having openings P, P′, and P^2, respectively, for the escape of the smoke, the said openings being staggered successively, so as to deflect the smoke-currents passing from one to the other in a manner well calculated to arrest and turn back any fine cinders that may still remain in the smoke. Over openings P^2 in the upper cone oblique vanes Q are applied to deflect the issuing smoke and give it a whirling motion to facilitate the draft.

Above the top of the neck O there is a wind-trap, R, formed by the bulged collar S, connected to neck O below the top, in which trap the wind blowing over the top T and tending to descend in the smoke-passage will be arrested and turned upward, along with the smoke.

The cones L, M, and N are fitted in a cylinder, V, that is fitted detachably in neck O, and provided with handles W, with which to lift it out rapidly.

The jacket B is constructed in two parts that are jointed together at X by bands Y and slip-bolts Z, so that it can be readily taken apart, removing everything above curb H, so that the wire-gauze guard E′ may be lifted out by its handles *a* for cleaning and repairs.

The deflector E is attached to the smoke-pipe by means of rods *b* and check-nuts *d*.

Having thus fully described my invention,

what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of curb H with deflector G, wire-gauze guard E′, deflector E, jacket B, and smoke-pipe A, substantially as specified.

2. The nest of hollow inverted perforated cones L M N, having openings P P′ P² arranged in staggered order, and said cones being combined with a smoke-pipe, substantially as specified.

3. The combination of the nest of hollow inverted and perforated cones L M N with the deflector G, wire-gauze guard E′, deflector E, jacket B, and smoke-pipe A, substantially as specified.

4. The nest of cones L M N, having perforations, as described, and being detachably arranged in the neck O of the smoke-pipe, substantially as described.

5. The jacket B, constructed in sections and jointed at X, as described, and having the deflector G and the cones L M N attached to the upper section for removal therewith, substantially as specified.

6. The pipe A, the wire-gauze guard E′, fitted detachably on the curb H, and the cone C, substantially as shown and described.

7. The wire guard E′, in combination with jacket B, cone C, and the pipe A, said wire guard being made equal in size at the lower end with the interior of the jacket to fill the same at and a short distance above the cone, and tapering therefrom to the curb H to turn the sparks upward inside of said wire guard, substantially as described, and whereby, also, the space F is formed for the passage upward of the smoke, dust, and broken cinders passing through the said wire-gauze, substantially as described.

8. The combination, with cone C, deflector E, smoke-pipe A, and jacket B, of wire guard E′, tapering from bottom upward, substantially as specified.

9. The combination of the dead-air space J with deflector G, curb H, deflector E, and passage K, as shown and described.

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Witnesses:
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