(No Model.)

M. A. SIMS.

SPARK ARRESTER.

No. 263,362. Patented Aug. 29, 1882.

Fig. 1

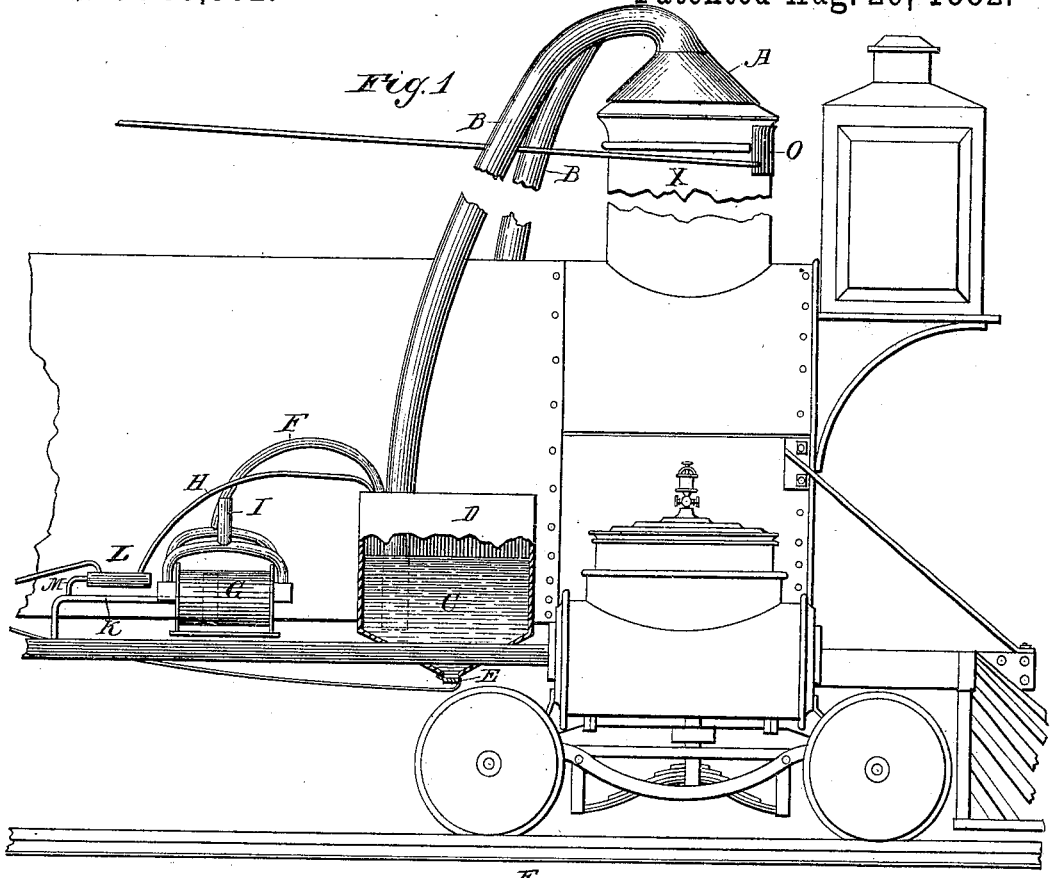
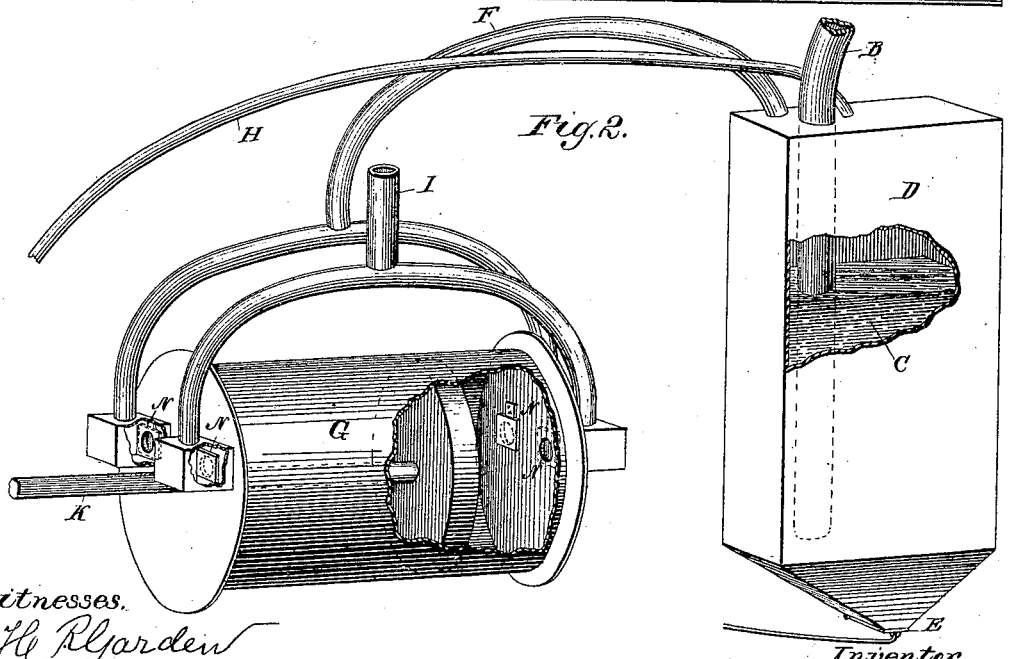


Fig. 2.



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MATHEW A. SIMS, OF WARRENTON, VIRGINIA.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 263,362, dated August 29, 1882.

Application filed April 3, 1882. (No model.)

To all whom it may concern:

Be it known that I, MATHEW A. SIMS, a citizen of the United States, residing at Warrenton, in the county of Fauquier and State of Virginia, have invented a new and useful Spark Arrester and Extinguisher and Smoke-Purifier, of which the following is a specification.

The object of my invention is to arrest and extinguish the sparks and cinders and purify the smoke emitted from steam-engines, and at the same time increase the draft from the fire-box to the point of discharge.

I am aware that it is not new to exhaust the sparks and gases from the smoke-stack and to discharge them into water through the pumping-cylinder; but such soon gets out of order and fails to operate, for the reason that the gases and sparks first pass into the air-pump before being discharged, and thereby cutting the cylinder or choking up the same to such an extent as to render it entirely useless. I obviate this defect by first drawing the sparks and the heated gases through the water in the tank, and thereby cooling the gases that enter the cylinder, thus keeping the pumps cool and clean, and thereby in good condition at all times. I accomplish this object by means of devices which consist of a combination of pipes and tank, all arranged as shown and hereinafter described.

The accompanying drawings illustrate the principle, and show one method of attaching said machine to that class of engines called "railroad-locomotives."

Figure I represents a side view of a portion of a railroad-locomotive with the machine attached thereto. Fig. II represents an enlarged view of the tank and double-action pump and of the pipes connecting them.

Similar letters refer to similar parts throughout the several views.

I attach to the smoke-stack X a short funnel, A, from which two pipes, B B, extend downward, one on each side of the boiler. Each pipe enters water C, contained in a tank, D, located between the smoke-stack and the air-pumps, near the cylinder and steam-chest. In the bottom of the tank is a discharge cock or door, E, connected by a rod with the engineer's room. Said tank is also connected by a pipe, F, with a double-action pump, G, and by a supply-pipe, H, with the water-tank in the tender. Connected with the double-action pump is the discharge-pipe I. The double-action pump is worked by a piston-rod, K, attached to the cross-head of the engine. A pump, L, is also attached to the engine to supply the tank with water, and is operated by the cross-head or other moving part of the engine by which the desired stroke can be produced. In many engines the water-supply may be regulated by a simple stop-cock.

N N N N represent the valves in the double-action pump.

A door, O, in the top of the smoke-stack (or in the funnel) is connected by a rod with the engineer's room. The funnel in the drawings is attached to the top of the smoke-stack. It may be inserted in the side of the smoke-stack at any desired point, with a cut-off door or damper in the smoke-stack above it. The power may be applied to the piston of the double-action pump directly from the piston of the engine, or, where more convenient, as in many stationary engines, from the driving-wheel, axle, or shafting.

The discharge-pipe I may be carried back into the furnace where the gases are consumed.

The size of the pipes, tank, and double-action pump and their location will be determined by the character and size of the engine and the draft required.

Operation: When the engine is not in motion the cinders and smoke are discharged through the door in the smoke-stack, which is opened by the engineer for that purpose. When the engine is put in motion the door or damper in the smoke-stack is closed, and the double-action air-pumps, worked by the cross-head or otherwise, produce a continuous draft (increasing with the speed of the engine) from the fire-box through the flues, smoke-stack, pipes, and water in the tank into the cylinder of the double-action air-pump and out at the discharge-pipe attached thereto. The cinders, sparks, and impurities in the smoke are arrested in the water, and may be discharged at pleasure through the stop-cock or door in the bottom of the tank. The purified smoke or gases pass out through the discharge-pipe at-

tached to the double-action air-pump. The supply of water in the tank is maintained through the pipe connecting it with the tender, and is regulated by the water-cock or pump.

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

1. The combination, with the uptake of a steam-boiler, of the reservoir for the reception of the sparks, the pump for exhausting the gases from said reservoir, the parts being suitably connected, and the auxiliary water-supply pump arranged to supply the spark and smoke reservoir, all adapted for joint operation in the manner set forth.

2. A smoke and spark arresting device consisting of the uptake, a reservoir having an inclined or conical bottom, an exhausting-pump, and an auxiliary water-supply pump, being connected to each other and to the common cross-head or other moving part of the engine, all being arranged and combined in the manner set forth and described.

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