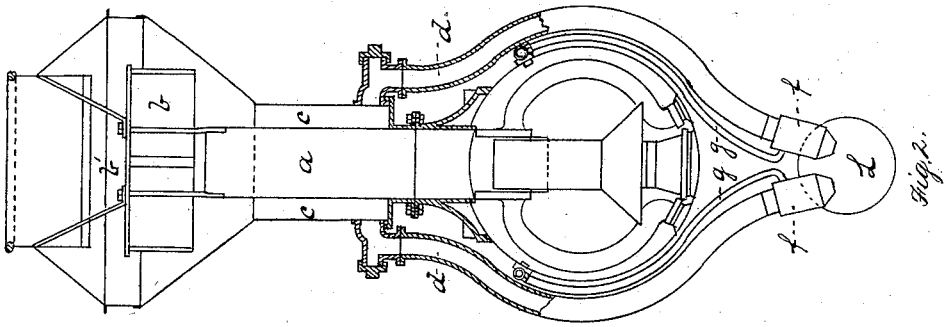
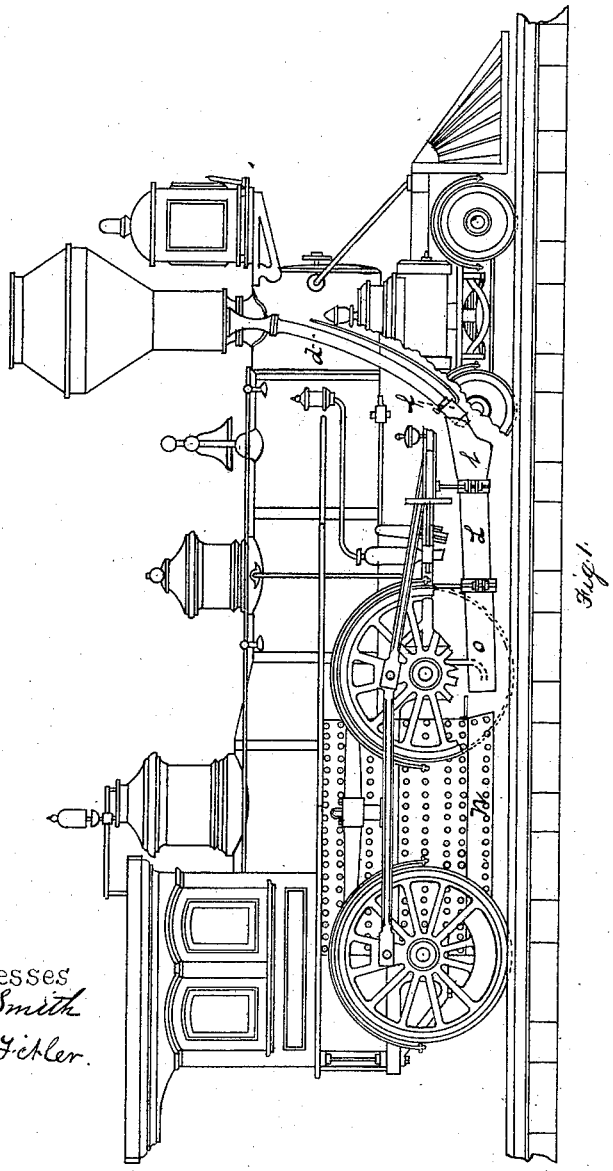
(No Model.)

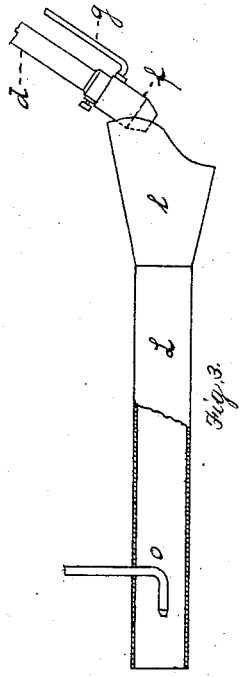
G. B. NICHOLS.

SPARK ARRESTER.

No. 264,331. Patented Sept. 12, 1882.







Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE B. NICHOLS, OF GALVESTON, TEXAS.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 264,331, dated September 12, 1882.

Application filed June 17, 1882. (No model.)

To all whom it may concern:

Be it known that I, GEORGE B. NICHOLS, of Galveston, in the county of Galveston and State of Texas, have invented a new and useful Improvement in Spark-Arresters; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side elevation of a locomotive-engine, showing my invention. Fig. 2 is a cross-sectional view of the same; and Fig. 3 is a detached view of the discharge-pipe and dust-conductor.

Like letters of reference indicate like parts wherever they occur.

My invention relates to an improvement in spark-arresters for locomotive-engines; and it consists in the construction and arrangement of devices by means of which the sparks are extinguished and the cinders distributed on the road-bed, while the fine dust is delivered into the ash-box; and it is an improvement on a spark-arrester invented by me forming the subject-matter of Letters Patent No. 253,883, dated February 21, 1882.

Although the invention described in said Letters Patent is perfectly satisfactory in its operation—extinguishing the sparks and distributing them as cinder in the road-bed—there is accompanying them a certain amount of fine dust, which is apt to adhere to and accumulate on the working parts of the locomotive-engine. This dust by my invention I collect and deposit in the ash-box, thereby preventing the machinery from becoming clogged and dirtied by the same.

I will now describe my invention, so that others skilled in the art may manufacture and use the same.

Inside of the smoke-stack is an inner pipe, *a*, into which the smoke and sparks are carried by the steam which is discharged into the lift-pipe. Over and above the top of the pipe *a* is a cone or cylinder, *b*, having the top closed by a diaphragm, *b'*, so that the sparks from the pipe *a* shall strike against the diaphragm *b'* and will fall into the space *c* between the inner pipe, *a*, and the smoke-stack. Opening out of the space *c*, at the bottom of the same, are pipes *d*, through which the sparks pass from the space *c*. These pipes *d* lead from the base of the stack to a point under the boiler in rear of the trucks. Around the end of the pipes *d* are water or steam jackets *f*, the water or steam being furnished from the boiler through the pipes *g* and discharged therefrom, meeting the sparks from the pipes *d* and extinguishing them. Under and in a line with the boiler is a cylindrical pipe, L, which leads from a point directly in rear of the discharge-opening of the pipes *d* to a point in front of the ash-box N of the locomotive. This pipe is open at both ends and is attached to the boiler or engine. It may be formed of sheet-iron about ten inches in diameter, and its forward end is flared or provided with a hood, *l*, the lower portion of which is cut away, as shown in the drawings. Leading from the boiler into the pipe L is a steam-pipe, *o*, which discharges steam toward the ash-box N.

The operation of these devices is as follows: The sparks, cinders, and smoke passing up the pipe *a*, the cinders and sparks strike against the diaphragm *b* and fall into the space *c;* thence they pass through the pipes *d*, the sparks being extinguished in the water or steam jacket *f*, and are discharged directly in front of the pipe or cylinder L, under the upper portion of the hood *l*. The heavier cinders, by their gravity, fall directly upon the road-bed, while the finer cinders and dust are carried by the draft caused by the motion of the train and by the action of the steam passing from the steam-pipe *c* into the pipe L, from which they are discharged before the open door of the ash-box N, within which they are collected, thereby increasing the draft and preventing annoyance and injury from the dust and dirt. The pipes *d* and L constitute a conduit for conveying dust and cinders from the stack, and from which they are discharged separately.

The advantages of my invention are that the draft in the fire-box is increased and combustion is promoted, thereby causing a great saving in fuel. The sparks are completely extinguished, and the engine and cars are kept clean and free from dust and cinders. The different parts of the apparatus are simple, not liable to get out of order, and will not clog with dirt. They are also cheap, light, and easily constructed and placed on the locomotive-engine; and also the heavy cinders which would clog

and choke the pipes and ash-box and interfere with the combustion in the fire-box are also separated from the light and injurious dust, which is easily carried by the draft and buried in the fire-box, passing up thereinto with the draft from the ash-pan.

I am aware that smoke-consumers and spark-arresters have been used on locomotive-engines, whereby the smoke and cinders have been conducted from the smoke box or stack to the fire-box; but all these are more or less complicated, are apt to clog with the dirt, are expensive, and are liable to get out of order. I therefore do not claim these devices; but,

Having thus described my invention, what I do claim is—

1. In a locomotive-engine, a conduit leading from the stack to or to a point in front of the ash-box for conveying the dust and cinders from the stack, and having an opening for the escape therefrom of the cinders or heavier particles, substantially as and for the purposes described.

2. In a locomotive-engine, the combination of a conduit for leading the cinders and dust from the stack, with a separator for separating the cinders from the dust, substantially as and for the purposes described.

3. In a locomotive-engine, a pipe or pipes leading from the stack for the purpose of conveying the dust and cinders therefrom, in combination with an extinguishing device for extinguishing the sparks, a separator for separating the heavy cinders from the light cinders and dust, and a pipe for leading the latter to or to a point in front of the ash-box, substantially as and for the purposes described.

4. In a locomotive-engine, a pipe or pipes for conveying sparks and cinders from the stack, in combination with a pipe leading from the discharge of said pipe or pipes to a point in front of the ash-box, and a steam-jet in said pipe, substantially as and for the purpose described.

5. In a locomotive-engine, a pipe or pipes for conveying sparks and cinders from the stack, in combination with a dust-pipe leading from the discharge of said pipe or pipes to a point in front of the ash-box, said pipe having a flaring or hooded mouth, the lower portion of which is open or cut away, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 22d day of May, A. D. 1882.

GEORGE B. NICHOLS.

Witnesses:

WILLIAM H. MERTIN,

HARRY F. NICHOLS.