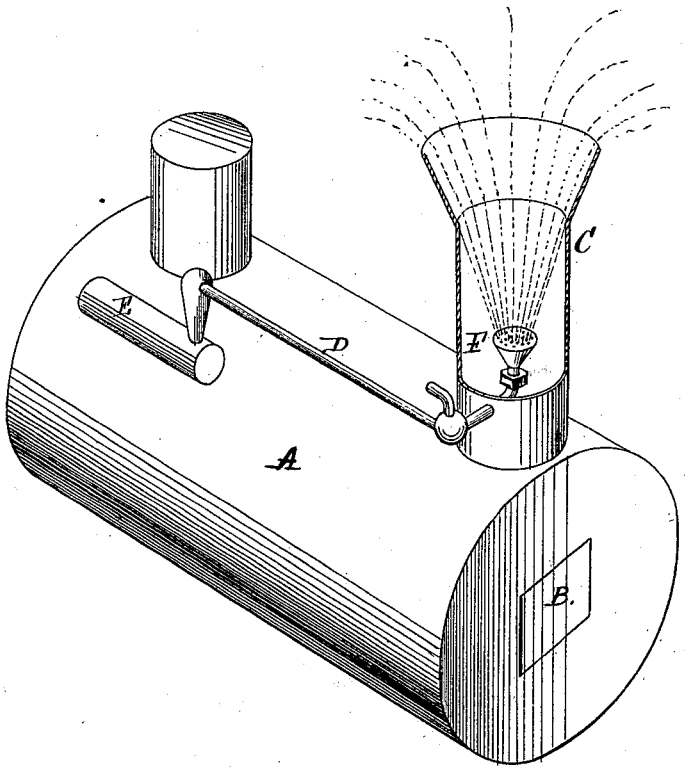
J. JOHNSON.
Spark-Extinguisher.

No. 204,739. Patented June 11, 1878.



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UNITED STATES PATENT OFFICE.

JOHN JOHNSON, OF BLOOMFIELD, CALIFORNIA.

IMPROVEMENT IN SPARK-EXTINGUISHERS.

Specification forming part of Letters Patent No. **204,739**, dated June 11, 1878; application filed September 16, 1876.

To all whom it may concern:

Be it known that I, JOHN JOHNSON, of Bloomfield, county of Sonoma, and State of California, have invented an Improved Spark-Extinguisher; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings.

My invention relates to certain improvements in that class of spark-extinguishers used in the smoke-stacks of engine-furnaces, and in which water is employed in various forms to kill or quench the sparks.

It consists in the employment of a rose-sprinkler having minute perforations, through which water is forced upward in the same direction as the sparks move.

It also consists in a novel arrangement of the perforations and the top of the sprinkler, in order to prevent the minute jets from being reunited by the action of the exhaust, so as to form large drops or streams of water, as this will reduce the efficiency of the extinguisher, besides throwing the water and soot over all the machinery near.

In the dry harvest-fields where there is a nearly rainless climate, if an engine is used, it is extremely dangerous to the surrounding combustible material, and water is almost always scarce, so that the amount used for an extinguisher of this class, in addition to that required for the engine, is an important feature. By the use of my device I am enabled to perfectly quench the sparks with a small quantity of water.

Referring to the accompanying drawings for a more complete explanation of my invention, A is the boiler, B the furnace, and C the smoke-stack, of an engine. I have not shown in this case anything more than a representation of the parts of the engine sufficient to show the attachment of my device. This consists of a rose or sprinkler, F, of peculiar construction, which is supported above the exhaust-nozzle in the smoke-stack, and has a pipe, D, leading to it from the feed-pump E, which is, in the present case, represented as secured to one side of the boiler.

It will be seen that any suitable forcing apparatus may be employed; but the ordinary feed-pump is usually the most convenient, and when my device is employed with it it serves to relieve the pump from the air which will collect when the engine is stopped. It also serves to keep the pump in better working order by carrying more water.

The rose or sprinkler does not differ in general appearance from other sprinklers of this class, although it is different in some points of construction. It consists of a convex top, a hollow conical body, and a nut at the base, into which the pipe D is screwed. The convex top is perforated with holes as minute as possible, and they are arranged so as to alternate and not stand in radial lines, because the force of the exhaust-steam moving directly up the stack has a tendency to throw the jets which have been spread by the shape of the sprinkler back toward the center, and also to unite them into larger streams, instead of shattering them into a mist, as has been supposed. The hole in the nut is smaller than that in the pipe, and thus concentrates the stream from that point, so that it strikes the unperforated center of the convex top. This prevents the formation of a central stream of solid water, and aids in the separation of water into jets.

I am aware that various attempts have been made to use water to quench the sparks and cinders before they leave the stack, either by throwing a thin sheet of water across the stack, or by discharging the water into the exhaust-pipe, or by throwing it into the stack by some form of jet not specially contrived. These have all been failures, because in practice it will be found that there is a tendency of the water to concentrate into larger streams or drops, instead of being formed into a mist by the force of the steam; and this not only fails to quench the sparks, but scatters dirty water and soot all about the engine.

My experience has proved that the water must be reduced to the minutest form possible before being discharged into the stack, and then prevented from reuniting; and I effect it with my apparatus so thoroughly that no appreciable moisture is thrown out, but a dry mass of straw may be laid upon the top of the stack, and it will not be ignited.

It is a well-known fact that wet steam will quench the sparks better than a sheet or

streams of water; and experience has also shown that water in the form of sheets or streams will also impede the draft to such an extent as to make it impossible to keep up steam with the damp fuel which it is often necessary to use. With my device the water is practically so thoroughly united with the steam, which is often highly superheated, that it becomes, practically, a part of it, and acts as wet steam. This will effectually quench the sparks, and no bonnet will be needed, thus avoiding the expense and the time lost in cleaning when the bonnet becomes foul.

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

The feed-pump E, in combination with the rose or sprinkler F and its supply-pipe and regulator D, for the purpose of extinguishing sparks in the stack and to relieve the pump of air, substantially as herein described.

In witness whereof I hereunto set my hand and seal.

JOHN JOHNSON. [L. S.]

Witnesses:
V. STILLWELL,
C. H. PALMER.