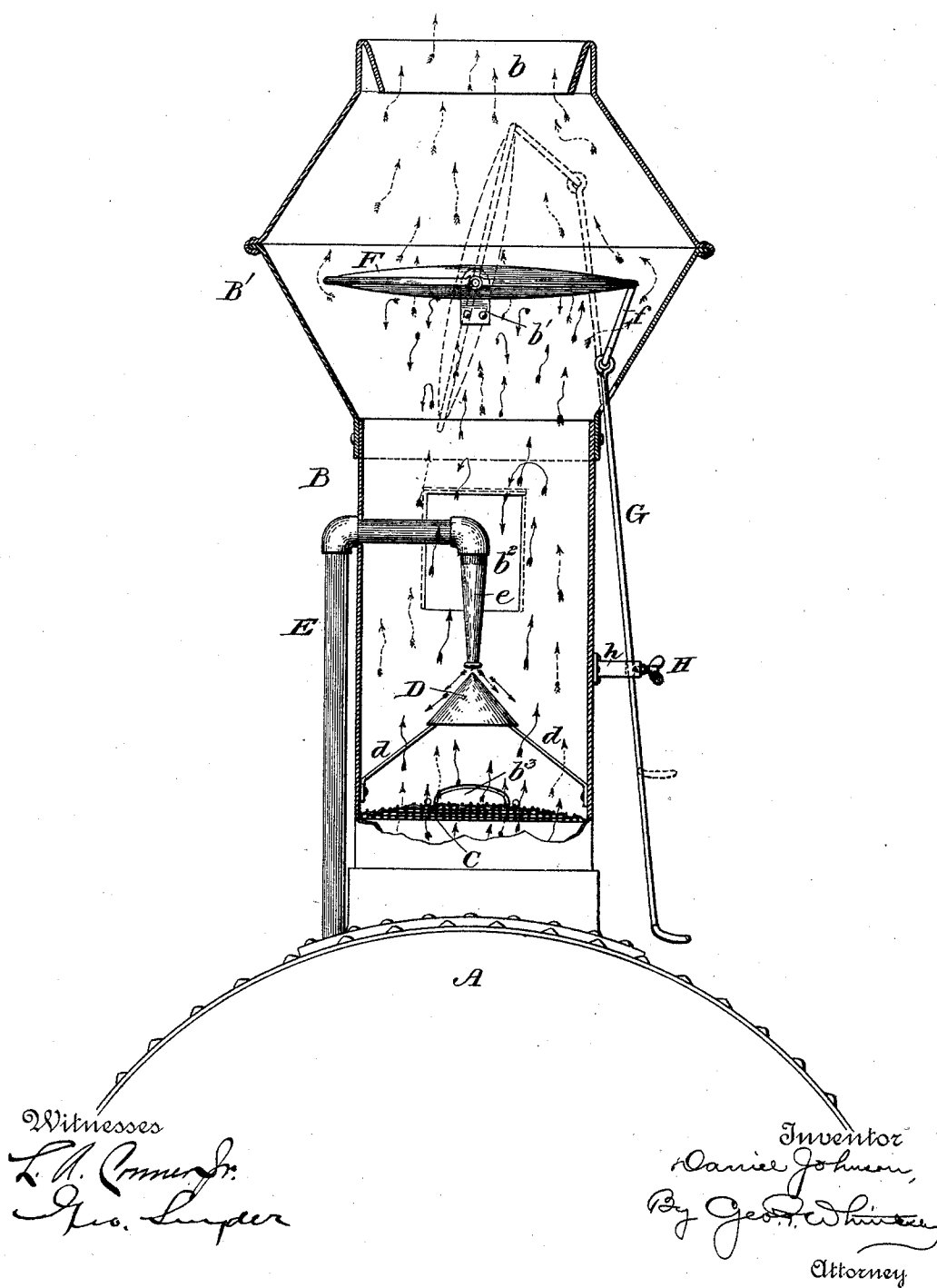


(No Model.)

D. JOHNSON.
SPARK ARRESTER.

No. 462,008.

Patented Oct. 27, 1891.



UNITED STATES PATENT OFFICE.

DANIEL JOHNSON, OF CROOKSTON, MINNESOTA.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 462,008, dated October 27, 1891.

Application filed June 19, 1891. Serial No. 396,844. (No model.)

To all whom it may concern:

Be it known that I, DANIEL JOHNSON, a citizen of the United States, residing at Crookston, in the county of Polk and State of Minnesota, have invented certain new and useful Improvements in Spark-Arresters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to spark-arresters, and its object is not only to effectually prevent the ejection of sparks from a smoke-stack but also to extinguish them. I make use of a reticulated diaphragm, a hinged deflector, and a water or steam jet, as hereinafter set forth, and particularly pointed out in the claims.

The drawing shows a vertical section of a smoke-stack equipped with my improvements.

The stack is erected upon a smoke-box A, as usual. It has, preferably, a cylindrical barrel B, surmounted by a head B', composed of two frusto-conical sections. The upper section has an inturned conical flange *b* around the opening in its center. Near the foot of the stack is a fixed diaphragm C, of strong wire-netting or other suitable reticulated material. A short distance above this diaphragm is a small cone D, supported centrally in the stack by braces *d*, fastened to the barrel B. A pipe E enters the stack a suitable distance above the cone, and is provided with a vertical nozzle *e*, projecting downward and adapted to discharge water or steam directly upon the apex of the cone. In the head B' of the stack is a deflector F, consisting of a preferably spheroidal disk supported pivotally on a horizontal axis by means of trunnions resting in bearings *b'*, fastened to the inside of the head B'. Projecting from one side of the deflector is an arm *f*, to which is jointed a rod G, which passes down through a suitable hole near the base of the head B' and terminates at a convenient point near the smoke-box, as shown, where it may be provided with a handle. A clamp is provided to hold the rod G

at any height, preferably a set-screw H, mounted in a bracket *h*, secured to the stack, and through which the rod slides. By these means the deflector can be adjusted to any angle desired.

Suitable hand-holes *b²* *b³* in the barrel B afford access to the nozzle, cone, and diaphragm.

The operation of my device is as follows: Upon starting up the fire the deflector is set vertically, as shown in dotted lines, so as not to obstruct the draft. When the fire is burning well, the deflector is restored to its horizontal position. The larger sparks are caught by the netting; but such as pass through it are carried up against the convex under surface of the deflector, by which they are thrown off to the sides of the barrel, and their momentum being checked they fall down upon the netting. The diameter of the deflector is greater than that of the barrel B, so that it interrupts the entire column of smoke and gases. Space is left, however, between the edges of the deflector and the head B' for the smoke and hot gas to pass around it and on up out of the top of the stack. Should any sparks pass the deflector they are carried up the inclined surface of the head until caught by the flange *b* and thrown down upon the convex top of the deflector, whence they slide down into the stack. A jet of water or steam (live or exhaust) from the nozzle *e* is allowed to play either constantly or intermittently upon the cone D, by which it is sprayed upon the sparks held by the netting and quickly extinguishes them. The cinders can be readily removed from time to time through the hand-hole *b³*.

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

1. A spark-arrester consisting of the combination, with the smoke-stack, of the reticulated diaphragm, the cone above the diaphragm, the pipe adapted to deliver water upon the cone, and the deflector in the upper part of the stack, substantially as set forth.

2. The combination, with the stack, of the reticulated diaphragm, the cone above the same, the downwardly-projecting nozzle adapted to deliver water or steam on the apex of

the cone, and the deflector pivoted on a horizontal axis in the upper part of the stack, substantially as set forth.

3. The combination, with the barrel B and
5 the head B' thereon, having the intumed flange
b, of the netting C and the cone D, fixed in
the lower part of the stack, the pipe E, having
a nozzle e for delivering water or steam upon
the cone, and the deflector F, pivoted on a

horizontal axis in the head B' and having an
adjusting-rod G attached thereto, substan-
tially as set forth.

In testimony whereof I affix my signature in
presence of two witnesses.

DANIEL JOHNSON.

Witnesses:

FRANK IVES,
S. M. OLSON.