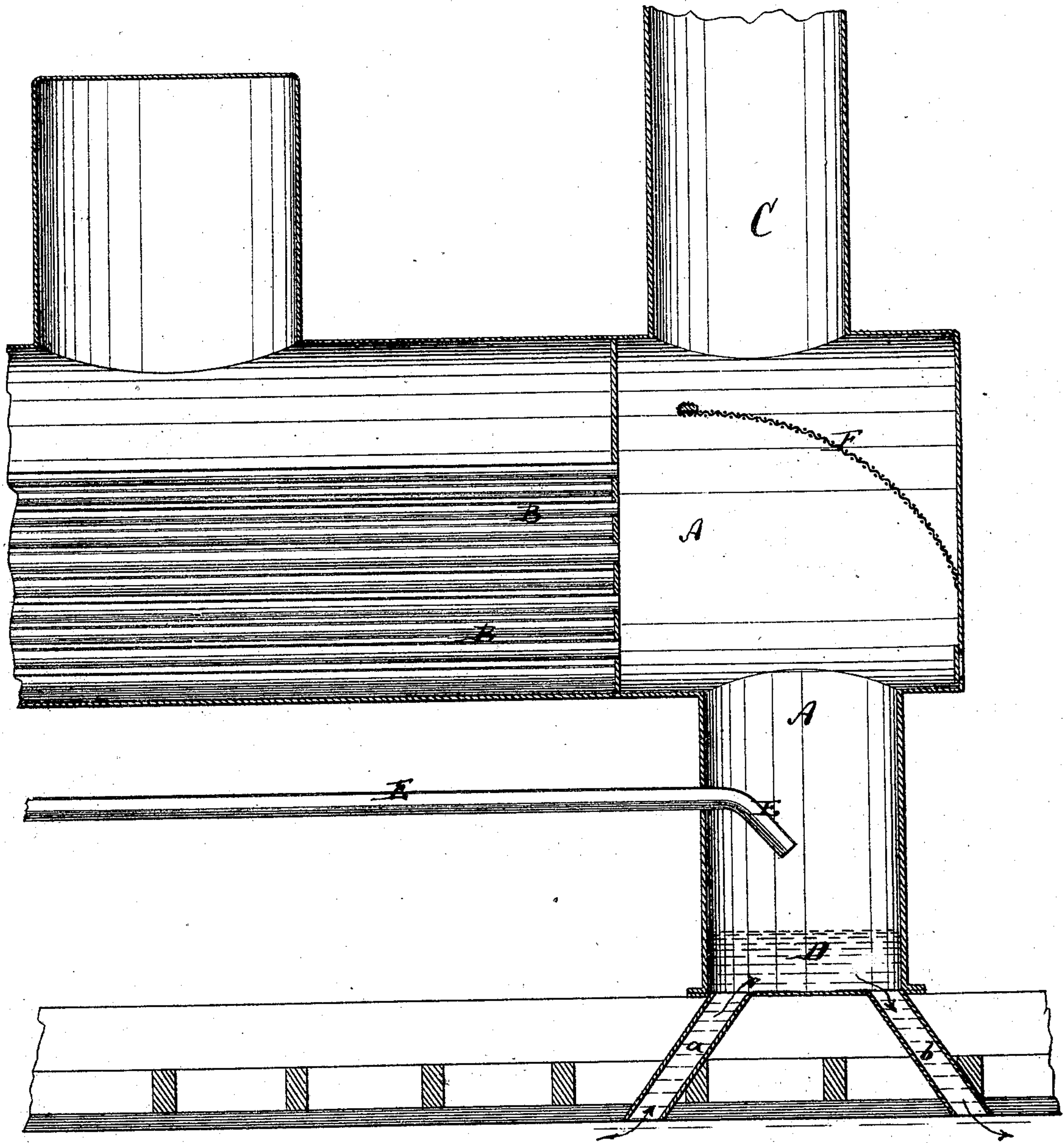


J. GATES.

Improvement in Spark Arresters for Steam Boilers.

No. 120,428.

Patented Oct. 31, 1871.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN GATES, OF PORTLAND, OREGON.

IMPROVEMENT IN SPARK-ARRESTERS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. 120,428, dated October 31, 1871.

To all whom it may concern:

Be it known that I, JOHN GATES, of Portland, in the county of Multnomah and State of Oregon, have invented a new and Improved Spark-Arrester for Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which the drawing represents a vertical longitudinal section of part of a boiler provided with my improved spark-arrester.

My invention consists in the improved spark-arrester for steamboats, hereinafter fully described and subsequently pointed out in the claim.

A represents the back connection or smoke-box of a tubular boiler. In stopping the spark or coal I take advantage of the angle or turn which the air and smoke makes from the horizontal tubes B to the perpendicular smoke-stack C. The greater velocity of the coals, owing to their greater weight, carries them past the lower entrance of the smoke-stack to where there is an eddy, or at least insufficient draught to lift them, so that they will fall to the bottom of the smoke-box. At this bottom there is a water-well, D. On boats the same may be produced by cutting an opening or slot through the bottom of the boat, so that the coal, &c., will fall directly into the water that carries the boat. The water-well may also be provided with two sets of inclined apertures or pipes, *a b*, through one of which, *a*, the water enters, while it escapes through the other *b* during the movement of the boat. A constant current of water passes thus through the well, carrying off the coal and sparks that reach the same. The well may, if desired, be of other construction, so as not to be connected with the bottom of the boat. It may, for stationary boilers or on locomotives, be only a plain water-ves-

sel. I do not confine myself to any particular arrangement of said well, nor of pipes or holes for producing a constant current of water through the same. The well will also answer to receive and remove all mud and dirt cleaned, blown, and washed out of the boiler. E is a water blow-pipe entering the lower part of the smoke-box. Its end is bent toward the discharge-hole or pipe *b*, so that it will serve to blow water through said hole or pipe *b* for the purpose of facilitating the discharge, preventing the clogging by an accumulation of coal or cinders, and overcoming the noise made when they are blown into the air. F is a wire or perforated screen, set in the smoke-box at some distance from the tubes B and somewhat higher than the same, so that the sparks are thrown under the screen and are thereby kept from ascending the smoke-stack.

By my invention the coals are arrested without making the smoke-stack heavy; as the screen is set in the smoke-box, with the exhaust above, less volume of vapor is carried through the screen than would be if it were on top, and it is also, therefore, less liable to foul. The coals, when once dropped, never rise again as in other spark-arresters, where they dance against the screen until broken fine enough to pass through. The well furnishes good opportunities for getting rid of the blow-off pipes and deadening the noise usually made by them.

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

The arrangement of an air-tight well in an opening through the bottom of a steamboat, and connected with the smoke-box thereof, as described, for the purpose of receiving and discharging the coals, water, and mud from the blow-off pipes, in the manner described.

JOHN GATES.

Witnesses:

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