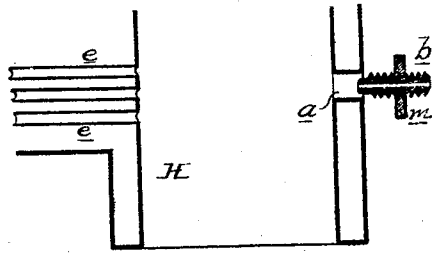
H. W. ADAMS.

Improvement in Furnaces for Tubular Steam-Boilers.

No. 130,268. Patented Aug. 6, 1872.



Witnesses.
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AM. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS.)

UNITED STATES PATENT OFFICE.

HENRY W. ADAMS, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN FURNACES FOR TUBULAR STEAM-BOILERS.

Specification forming part of Letters Patent No. **130,268**, dated August 6, 1872.

SPECIFICATION.

I, HENRY W. ADAMS, of the city and county of Philadelphia and State of Pennsylvania, have invented certain Improvements in Locomotives, of which the following is a specification:

Nature and Objects of the Invention.

My invention has for its object the maintaining of the tubes of steam-boilers in a cleanly condition, the thorough consumption of the fuel and smoke and gases emanating therefrom in the furnaces of steam-boilers, and the disintegrating of the sparks arising from the fuel. These objects I attain by combining with the furnace of the boiler an injector or injectors, so arranged as to discharge currents of air, steam, or both across the fire-place and into the tubes of the boiler, as best observed in the vertical section of part of a locomotive-boiler, shown in the accompanying drawing, H being the fire-box; *e e*, the tubes; *a*, an opening in front of the fire-box, and *b* a nozzle smaller than the opening *a*, and projecting into the same. A volume of the external air is caused by the action of the forcible jet from the nozzle to rush into the furnace, the extent of this volume depending upon the adjustment toward or from the fire-box of a disk, *m*, adapted to the threaded exterior of the nozzle. Compressed air derived from an air-pump operated by the engine may be forced through the nozzle *b;* or, in place of air, live steam from the boiler may be used, or a portion of the steam from the exhaust-port of the engine.

The effect of my invention is fourfold: first, the blast, acting mechanically, will tend to maintain the tubes in a cleanly condition; second, the air induced by the jets to enter the furnace affords an abundant supply of oxygen to the gases above the fuel, and insures the most thorough consumption of the same; third, the blast tends to disintegrate the particles of fuel which would otherwise pass, in the condition of ignited sparks, up the chimney, as in ordinary locomotive-boilers; and, fourth, the currents of oxygen forced into the tubes effectually consumes any combustible gases which may gain access to the same.

Claims.

1. The combination with the furnace of a steam-generator of an injector or injectors, so arranged as to discharge a current or currents of steam, air, or both across the fire-place and into the boiler-tubes, for the purpose set forth.

2. An injector, arranged as described, and communicating with the exhaust-port of the engine, for the purpose set forth.

3. The disk *m* or its equivalent, arranged in respect to the nozzle *b* and opening *a*, and operating as described.

HENRY W. ADAMS.

Witnesses:

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