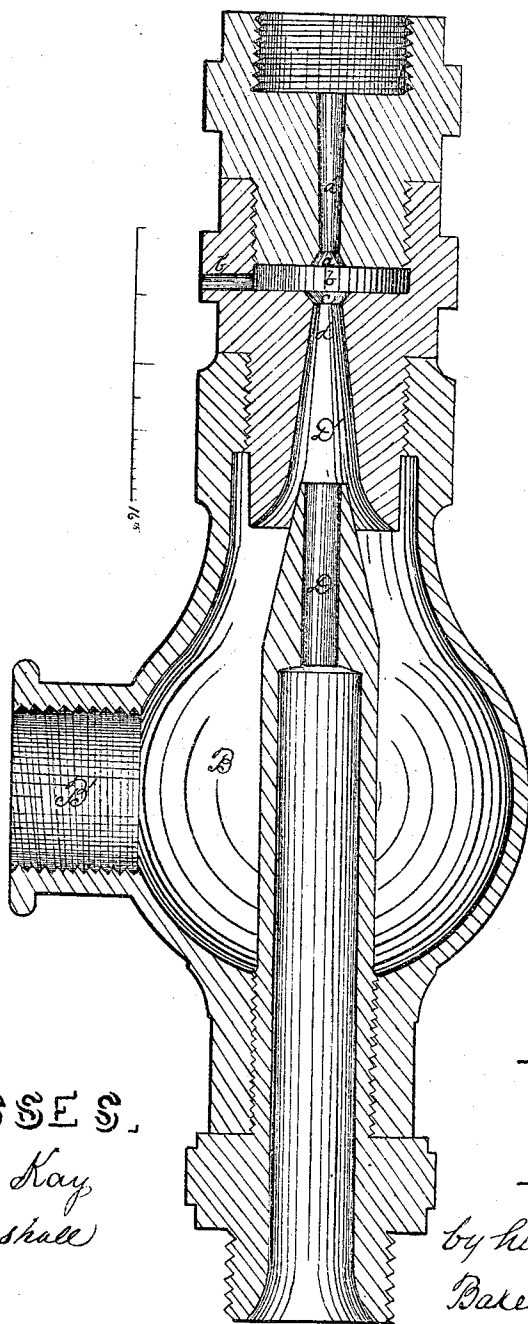


T. O'RORKE.

Improvement in Steam-Boiler Injectors.

No. 129,491.

Patented July 16, 1872.



WITNESSES.

James I. Kay,
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UNITED STATES PATENT OFFICE.

THOMAS O'RORKE, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN STEAM-BOILER INJECTORS.

Specification forming part of Letters Patent No. 129,491, dated June 16, 1872.

SPECIFICATION.

To all whom it may concern:

Be it known that I, THOMAS O'RORKE, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Injectors for Steam-Boilers; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing making a part of this specification, which represents a longitudinal view of my improved injector.

One of the chief difficulties connected with the use of what is commonly known as the Giffard injector is that a steam-boiler pressure of from about forty to sixty pounds is requisite to operate it satisfactorily. I have found that by varying the size, shape, and arrangement of the water and steam passages just forward of the place of junction of the steam and water, as hereinafter described, I am enabled to feed water into the boiler at a much lower pressure than is commonly employed for that purpose.

To enable others skilled in the art to make and use my improvement, I will proceed to describe its construction and mode of operation.

B represents the ordinary head; B', the water-supply-pipe; and D, the steam-nozzle, which latter plays into a coniformed throat, D'. This throat contracts gradually till it presents a comparatively small orifice, *d*, and at its forward end it terminates in a countersink, *c*, though this countersink is not necessary. From this it opens into a chamber, *b*, of a diameter about equal to that of the main pipe. From and through the opposite wall of this chamber a small throat or orifice leads to the main pipe. This orifice commences with a short conical hole or countersink, *a*, and from the smaller end of the countersink the orifice *a'* gradually enlarges, as shown, till it opens into

the main pipe. From the chamber *b* a drain-hole, *b'*, carries off such water as may be arrested in that chamber by spraying out of the direct current or flow. The sizes of the orifices which I deem best for a steam-nozzle, D, of, say, one-fourth of an inch aperture, are—throat *d*, at its smallest part, next the countersink *c*, about three-sixteenths of an inch; the countersink *c*, (if used,) about one-sixteenth of an inch in depth, and greatest diameter about five-sixteenths of an inch; length of chamber *b* about three-sixteenths of an inch; the largest diameter of the countersink *a* about the same as the smallest diameter of the throat *d*; smallest diameter of orifice *a'*, about one-sixteenth of an inch less than the dimension last given, and from this the orifice *a'* enlarges through a length of about an inch and one-fourth to the smallest diameter of the throat *d*. For other sizes of injectors these dimensions may be correspondingly changed, and the dimensions given may in the injector described be varied somewhat, provided substantially the proportions indicated between the diameters of the throat *d* at its smaller end and the diameters of the orifice *a a'* at its opposite ends be maintained.

I have found in practice that an injector thus made can be worked with a much lower steam-pressure than the injectors now in common use.

What I claim as my invention, and desire to secure by Letters Patent, is—

The arrangement of the throat *d*, countersink *a*, and orifice *a'*, having the relative dimensions set forth.

In testimony whereof I, the said THOMAS O'RORKE, have hereunto set my hand.

THOMAS O'RORKE.

Witnesses:

A. S. NICHOLSON,
JAMES I. KAY.