

W. RANDALL

INJECTORS FOR STEAM-BOILERS.

No. 170,299.

Patented Nov. 23, 1875.

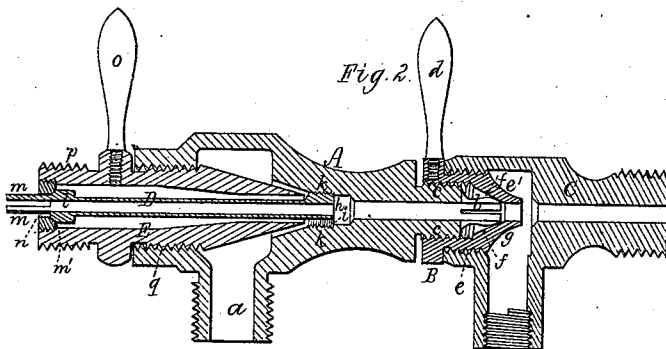
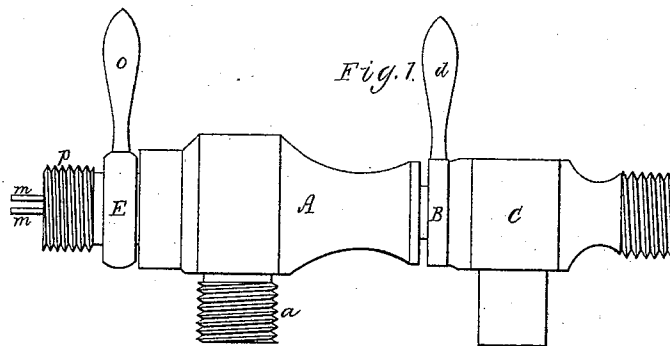


Fig. 8.

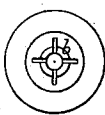


Fig. 6.

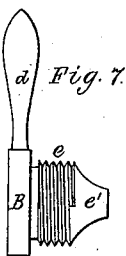
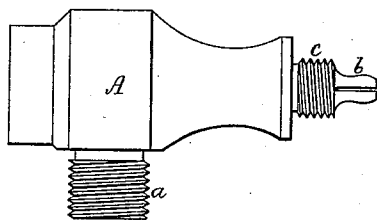


Fig. 3.

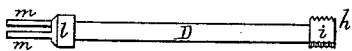


Fig. 4.



Fig. 5.



Witnesses.

S. V. Piper

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by his attorney

R. H. Eddy

UNITED STATES PATENT OFFICE.

WILLIAM RANDALL, OF SALEM, MASSACHUSETTS.

IMPROVEMENT IN INJECTORS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **170,299**, dated November 23, 1875; application filed October 12, 1875.

To all whom it may concern:

Be it known that I, WILLIAM RANDALL, of Salem, of the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Injectors for Steam-Boilers; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a side view, and Fig. 2 a longitudinal section, of an injector with my invention. Fig. 3 is a side view, and Figs. 4 and 5 opposite end views, of its tubular and valved stem. Fig. 6 is a side view of the case and its contractile eduction-nozzle, and Fig. 7 a side view of the nozzle-contractor.

My invention relates to means of regulating the inlet and discharge of water and steam relatively to the injector.

In the drawings, A denotes the water-receiving case, having an induct, *a*, and terminating at its front end in an elastic nozzle, *b*, an end view of which is shown in Fig. 8, such nozzle being formed as shown, and split longitudinally by saw-kerfs at right angles to each other. In rear of the nozzle *b* the case A is provided with a male screw, *e*, on which the contractor B is screwed. This contractor consists of a tube provided with a handle, *d*, a male screw, *e*, and a nose, *e'*, all being as shown, and the latter being tapered or conical both on its inside and outside, as represented at *f* and *g*.

On screwing the contractor upon the screw *e*, and against the split nozzle *b*, the latter may be contracted, so as to diminish its passage for the discharge of water, the inherent elasticity of the metal of the nozzle serving to expand the nozzle while the contractor is being unscrewed.

The overflow-receiver C, formed as shown, screws upon the contractor, as represented.

The object of so splitting the eduction-nozzle and providing it with a rotary adjustable contractor, as explained, is to regulate the amount of water discharged or thrown into the boiler, which may be accomplished by revolving the contractor more or less against the nozzle, as occasion may require.

Concentrically and axially within the case A there is fixed a tubular stem, D, provided with a cylindrical head, *h*, notched length-

wise, as shown at *i i i*, and having a screw cut on it externally to fit into a female screw, *k*, made in the case just in rear of the nozzle *b*. At its front end the stem, which is tubular throughout, is provided with another cylindrical head or valve, *l*, and three prongs, *m m m*, all being as shown. This valve is to operate with a valve-seat, *m'*, formed around the opening *n* of an adjustable hollow steam-receiving nozzle, E, as represented, it being provided with a handle, *o*, and two male screws, *p q*, arranged with it, as shown. This nozzle, screwed endwise into and arranged within the case A, in manner as exhibited in the drawings, is to receive upon its rearmost screw the steam-induct.

On revolving the nozzle E, which is open at its front end, and is closed at its rear end, except in having the small opening *n* therein, such nozzle may be caused to move endwise within the case A, so as, with the valve of the hollow stem, to either wholly or partially shut off the passage of steam into the space immediately around the stem.

The object, therefore, of the tubular stem and its valve, and the adjustable rotary nozzle and its valve-seat, all arranged together, and with the case A and its eduction-nozzle, in manner as described, is to regulate, at one and the same time, the amount of water received into the case and the amount of steam flowing into and through the rotary nozzle, all of which can be effected by revolving the said nozzle more or less, as circumstances may require.

I claim as my invention or improvement in a steam-boiler injector, as follows:

1. The contractile eduction-nozzle *b* and the adjustable contractor B, arranged and combined therewith, and with the case A, as specified.

2. The combination of the tubular stem D and its valve *l* with the receiving-case A, and with the adjustable hollow steam-receiving nozzle E, provided with the valve-seat *m'*, and arranged in and applied to the case A, all being substantially as set forth.

WILLIAM RANDALL.

Witnesses:

R. H. EDDY,
J. R. SNOW.