

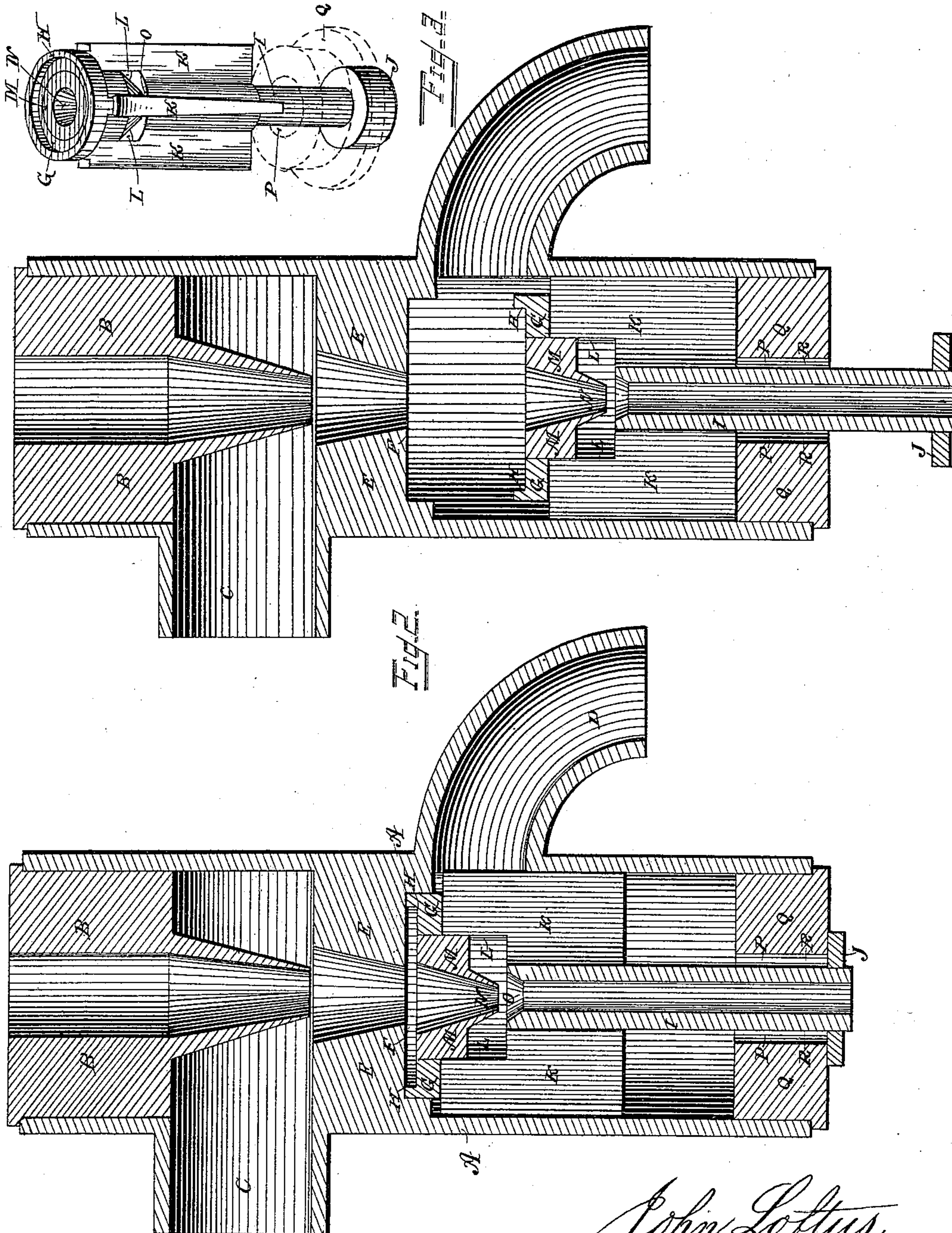
(Model.)

J. LOFTUS.

INJECTOR.

No. 348,025.

Patented Aug. 24, 1886.



WITNESSES

F. L. Ourand.
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UNITED STATES PATENT OFFICE.

JOHN LOFTUS, OF ALBANY, NEW YORK, ASSIGNOR OF ONE HALF TO PETER KINNEAR, OF SAME PLACE.

INJECTOR.

SPECIFICATION forming part of Letters Patent No. 348,025, dated August 24, 1886.

Application filed March 29, 1886. Serial No. 196,943. (Model.)

To all whom it may concern:

Be it known that I, JOHN LOFTUS, a citizen of the United States, and a resident of Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Injectors; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it ap-
10 pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a vertical sectional view of my improved injector, showing it ready for operation. Fig. 2 is a similar view showing the injector during its operation, and Fig. 3 is a detailed view of one of the parts of the injector.

Similar letters of reference indicate corresponding parts in all the figures.

My invention has relation to injectors for forcing water into steam-boilers by steam-pressure; and it consists in the improved construction and combination of parts of the same, as hereinafter more fully described and
25 claimed.

In the accompanying drawings, the letter A indicates the casing of the injector, which has the steam-nozzle B secured into its upper end, and which is formed with the water-inlet pipe C near its upper end and the overflow-pipe D near its lower end, having the overflow E in the space between the water-pipe and the combining-tube. The under side of
35 the combining-tube is formed with a recess, F, around its bore, and a piston, G, having its upper face slightly recessed, as shown at H, fits into this recess. This piston is formed with a downwardly-extending tube, I, having a flange, J, at its lower end, and provided at
40 the sides of its upper portion with laterally-projecting wings K, which bear with their outer edges against the sides of the lower portion of the injector-casing. The upper portion of this tube and the piston is bored out to form a recess of a larger diameter than the tube itself, so that apertures L are formed between the wings, and a nozzle or block, M, is inserted into this recess and retained there,
45 50 having its tapering nozzle portion N project-

ing into the space into which the apertures lead, and registering with a slight conical recess, O, in the tube. The tube slides with its lower portion in an aperture, P, formed in a plug, Q, secured in the lower end of the injector-casing, the said aperture being of a
55 larger diameter than the tube, so that an annular space, R, is formed around the tube, which space may be closed by the flange upon the tube, when the tube is drawn upward. 60

The tube and the annular aperture open to the boiler, and when steam is let in at the steam-nozzle the steam will first pass from the combining-tube out through the piston-tube, and the steam returning through the annular
65 aperture, together with the water which it raises, will force the piston upward into the recess in the under side of the combining-tube, when the water will cease passing out through the combining-tube, and will instead be forced
70 into the boiler through the piston-pipe, the flange at the lower end of which now closes the annular aperture, and the steam and water rushing through the piston-pipe will draw the water up through the overflow-pipe and
75 through the lateral apertures in the top of the piston-pipe, thus forcing the water which overflowed at the start of the injector, as well as the water passing in through the water-pipe, into the boiler. When the flow of steam is
80 cut off and the outlet into the boiler is stopped, the piston and pipe will fall down again, allowing any steam or water contained in the casing or pipes at the time of shutting off the steam to escape through the overflow. 85

If the supply of water at any time during the operation of the injector is stopped, the force of the steam will act upon the piston within the recess and force the piston down; but the annular flange covering the annular
90 aperture around the piston-pipe will have left its seat before the piston is forced out of the recess, allowing the steam to pass through the annular aperture and to cushion the force with which the piston is forced out of the
95 recess, and the injector will thus stop its function as soon as the water-supply is cut off, and will not resume it until water again flows through the water-supply pipe, when the injector will start again. 100

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In an injector for steam-boilers, the combination of a casing having a recess in the under side of the combining-tube with a piston fitting within the recess and having a tube opening with its upper end through it, provided at its lower end with a flange closing the aperture of the casing when the piston is drawn up within the recess, as and for the purpose shown and set forth.

2. In an injector for steam-boilers, the combination of a casing having a recess under the combining-tube and a piston in said recess having a tube extending from its lower side, said tube having apertures in its top and a flange at its lower end, said tube passing through a plug at the bottom of the casing having an aperture larger than the diameter of the tube, as and for the purpose set forth.

3. In an injector, the combination of a casing having a steam-nozzle at its upper end, and having a water-inlet pipe near its upper end and an overflow-pipe near its lower end,

and provided with a combining-tube having a recess in its under side, an annular plug secured in the aperture at the lower end of the injector-casing, a piston having a recess in its upper face, and having a pipe extending from its under side provided with wings bearing against the sides of the casing, and formed with a bore in the upper end of the pipe of a greater diameter than the pipe, forming lateral apertures between the wings, a lateral flange upon the lower end of the tube covering the annular aperture between the pipe and the edges of the aperture in the plug at the lower end of the casing, and a nozzle inserted into the bore at the upper end of the piston-pipe, with its tapering end projecting at the lateral apertures, as and for the purpose shown and set forth.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

JOHN LOFTUS.

Witnesses:

WM. LACY,

WM. F. HOURIGAN.