

(Model.)

H. F. COLVIN.

INJECTOR.

No. 303,986.

Patented Aug. 26, 1884.

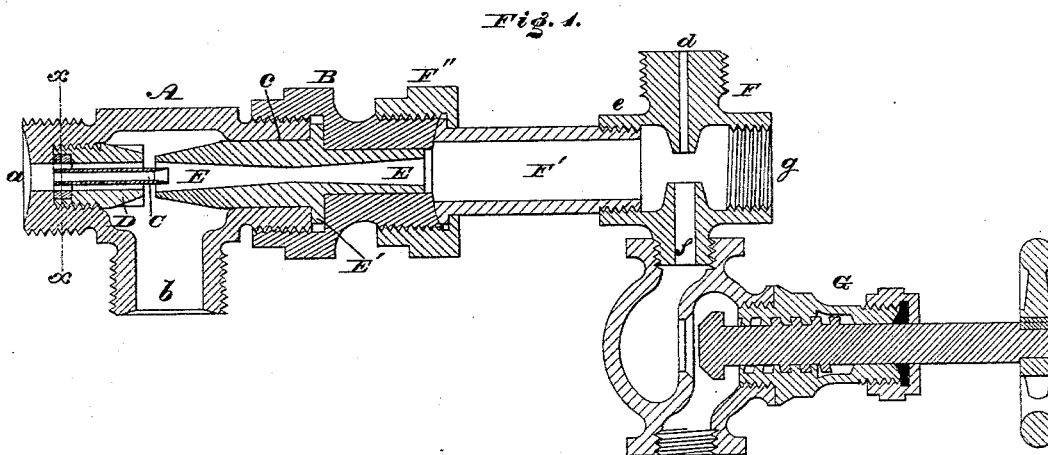
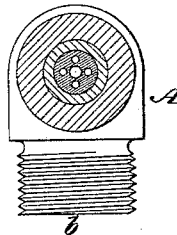


Fig. 2.



WITNESSES:

L. Downville  
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INVENTOR:

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# UNITED STATES PATENT OFFICE.

HENRY F. COLVIN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE  
RUE MANUFACTURING COMPANY, OF SAME PLACE.

## INJECTOR.

SPECIFICATION forming part of Letters Patent No. 303,986, dated August 26, 1884.

Application filed March 10, 1884. (Model.)

### *To all whom it may concern:*

Be it known that I, HENRY F. COLVIN, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Injectors, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of an injector embodying my invention. Fig. 2 is a transverse section in line *x x*, Fig. 1.

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

My invention consists of an injector having certain novel features, and provided with a lifter, as will be hereinafter fully set forth.

Referring to the drawings, A represents the body or shell of the injector, and B an extension-piece screwed thereto, said piece having its bore the entire length thereof, and said body having three branches, *a b c*.

C represents the main steam-tube, D the regulating steam-tube, and E the combining and discharge tube, formed in one piece, without any space between them, and having a circumferential flange, E', which is clamped between the ends of the body A and extension B, thus firmly holding the said tube E in position.

F represents a lifter consisting of a body formed with four branches, *d e f g*, the branch *e* being screwed to a tube, F', the latter being coupled with the extension B. Attached to the branch *f* is a valve, G.

Steam enters the main and regulating tubes C D, and water is admitted into the body A through the branch *b*, the steam and water passing through the combining and discharge tube E and pipe F', and so enters the body F, which acts as an overflow, the valve G being open. When the injector is in operation, the valve G is closed and water properly enters

and supplies the boiler. When water is to be lifted, the valve G is opened and a jet of steam admitted into the branch *d* of the lifter F, and, passing through the body thereof, enters the branch *f* and discharges through the valve G. This produces a partial vacuum in the injector, and the water is caused thereby to enter the injector, the latter then being worked by steam through the main and regulating tubes C D, the valve G being duly closed.

It will be seen that both the main steam-tube and surrounding regulating-tube force into the tube E, the latter being without any openings in its walls.

The lifter may be set to any angle or point between the injector and check-valve, the tube F' readily turning, and when the parts are adjusted the union or coupling F'' holds the same securely in position.

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

1. A lifter, F, consisting of the tubular branches *eg*, which are in the axial line of the injector, and the tubular branches *df*, which are arranged transversely thereto, in combination with steam-pipes and water-pipes and the overflow-valve G, attached to limb *f*, substantially as set forth.

2. A lifter, F, for an injector, consisting of the tubular branches *eg*, which are in the axial line of the injector, and the tubular transverse branches *df*, in combination with the flanged pipe F', which is screwed into branch *e*, and a cap, F'', which is screwed on the injector, and clamps the flange of pipe F' against the latter, but allows the axial movement of said pipe, substantially as set forth.

H. F. COLVIN.

Witnesses:

A. P. GRANT,  
OTTO BINDER.