

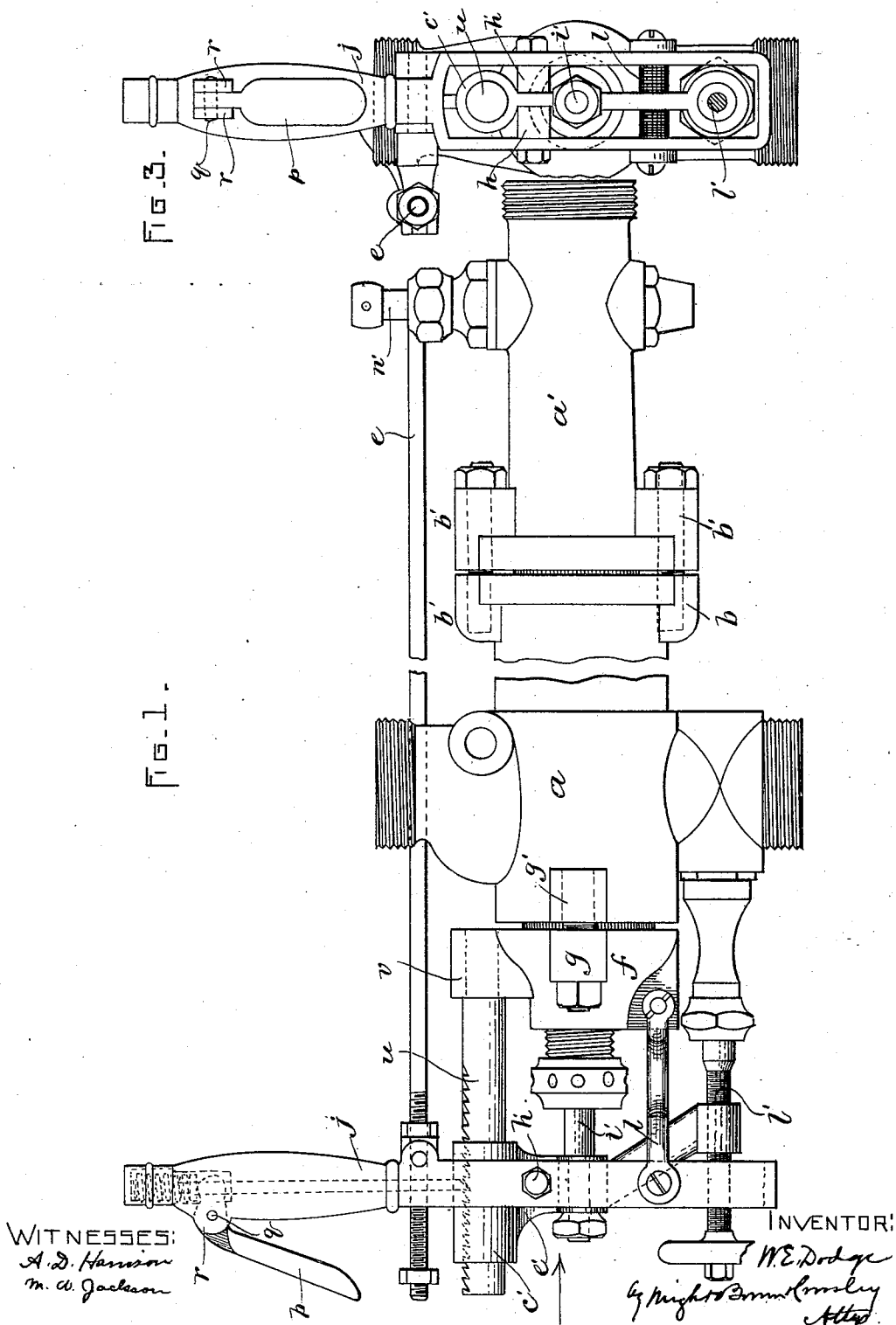
(Model.)

2 Sheets—Sheet 1.

W. E. DODGE.
INJECTOR.

No. 478,741.

Patented July 12, 1892.



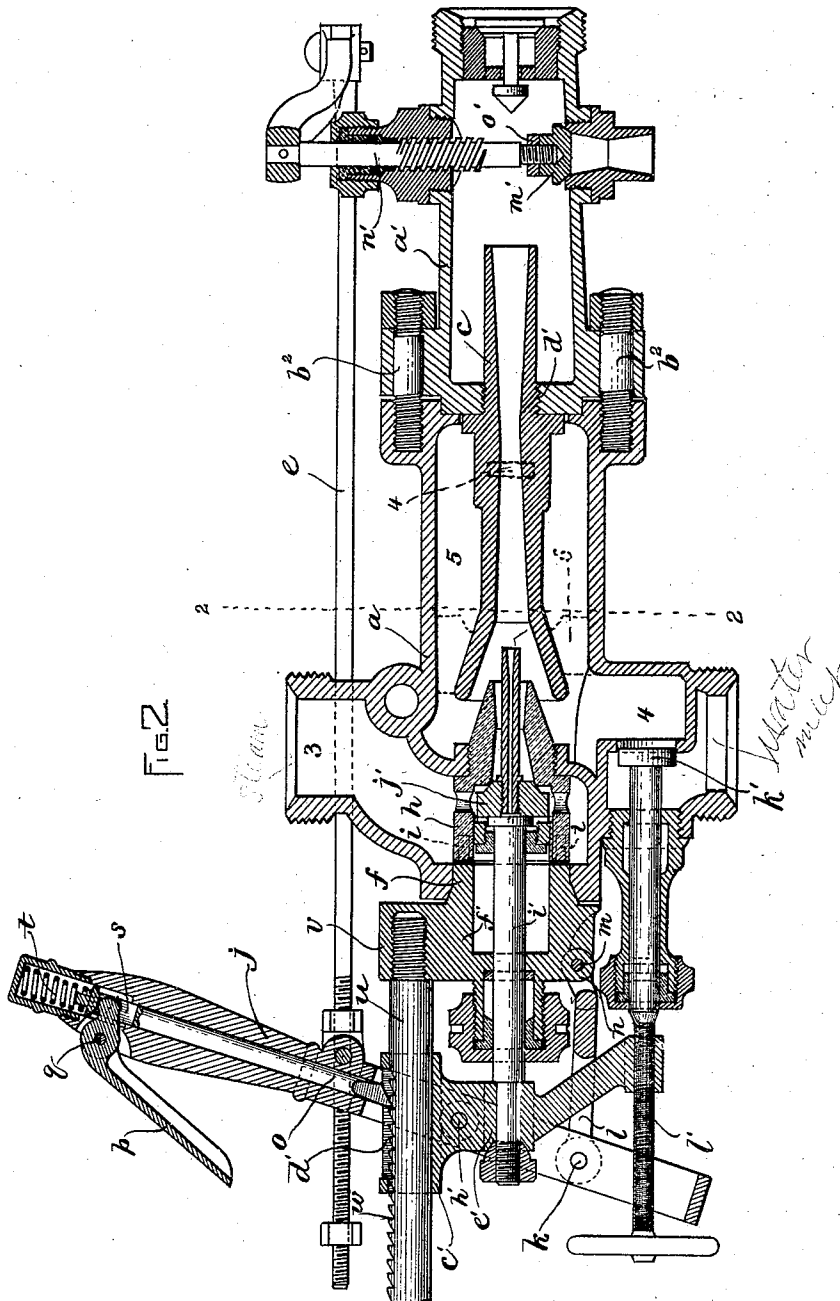
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W. E. DODGE.
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No. 478,741.

Patented July 12, 1892.



WITNESSES:
A. D. Harrison.
M. W. Jackson.

INVENTOR:
W. E. Dodge
by Wright & Brown, for filing.
Atty.

UNITED STATES PATENT OFFICE.

WALTER E. DODGE, OF EVERETT, MASSACHUSETTS.

INJECTOR.

SPECIFICATION forming part of Letters Patent No. 478,741, dated July 12, 1892.

Application filed April 1, 1892. Serial No. 427,318. (Model.)

To all whom it may concern:

Be it known that I, WALTER E. DODGE, of Everett, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Injectors, of which the following is a specification.

This invention relates to injectors of the type intended for use in supplying locomotive-boilers with water for generating steam; and it has for its object to provide an instrument of this class which embodies in its construction certain improvements tending to make the same more compact in space and convenient of operation and embodying features of construction whereby the parts comprising the same may be conveniently detached and assembled when so desired.

To these ends the invention consists in the improvements which I will now proceed to describe.

In the accompanying drawings, forming part of this specification, Figure 1 represents a side elevation of an injector embodying my improvements, a portion of the same being broken out. Fig. 2 represents a vertical longitudinal section of the same. Fig. 3 is an elevation of the rear end of the same, looking in the direction of the arrow shown in Fig. 1.

The same letters and numerals of reference indicate the same parts in all the figures.

It is usually the practice in attaching injectors of this class to the locomotive-boiler to place the same so that the operator may readily grasp the handle by which the instrument is operated, and it is usually placed in front of the seat of the engineer or fireman and attached to the boiler of the engine, with about one-half of the injector projecting into the cab. It will be seen, therefore, that it is of importance that the operative parts should occupy as limited a space as possible.

The principle upon which the injector operates being common and well known, I will simply specify the parts for the sake of clearness of illustration.

The main body of the injector is composed of two parts *a a'*, the outer portion *a'* being attached to the portion *a* by bolts or studs in lugs *b b'* on said portions, the object being to enable them to be readily separated to permit access to the interior and to render the cone readily detachable therefrom. *h* is the

steam-cone, *c* the delivery or combining cone, *m'* the waste-valve, 3 the steam-inlet, and 4 the water-inlet, of an injector comprising my improvements, these parts being of ordinary construction form no part of my invention.

The rear end of the main portion *a* is provided with an annular opening or socket, into which is fitted an annular flange *f* on a sleeve or gland *f'*. Said sleeve or gland has formed upon its exterior lugs *g*, by which it is secured to the main portion *a* by bolts or studs secured to lugs *g'* on said main portion, the arrangement being such that the ready detachment of said sleeve permits easy access to the cone *h*, which is provided with holes *i* (see dotted lines in Fig. 2) for the reception of a suitable wrench, whereby said cone may be removed from its screw-threaded connection with the main body *a*.

j represents an operating-lever pivoted at *k* to a forked arm *l*, which arm is pivoted at *m* to a fin or projection *n*, formed on the gland *f'*. The arm *l* as thus arranged forms a fulcrum, of which the operating-handle is the lever for the operation of the movable parts. The lower portion of said lever is yoke-shaped, as shown in Fig. 3, so that it may operate upon its pivot without contact with movable parts of the machine.

The operating-lever has formed upon its upper end a handle-shaped portion adapted to contain a pawl *o*, arranged to be operated by a lever *p*, pivoted at *q* to ears *r r* on said handle, the upper portion of the pawl being provided with a slot *s*, which receives the upper end of the lever *p*, as will be understood by reference to Fig. 2, the latter being held in the position shown by a spring *t*, suitably arranged to exert pressure thereon, as shown in the above-mentioned figure.

u represents a guide secured to a lug *v*, formed on the gland *f*. The upper side of said guide is provided with notches *w*, adapted to engage the pawl *o* for the purpose of regulating the feeding capacity of the machine. Fitted to slide upon said guide is a sleeve *c'*, having in its upper side a slot *d'* to receive the pawl *o*. Said sleeve has formed upon its under side an arm or yoke *e'*, which projects downwardly and forms a connection with the operative parts of the machine, as will be presently explained. The arm or yoke *e'* is

connected with the lever at h' , and when said lever is moved in either direction said arm is moved therewith.

i' represents the starting-stem rod, which is suitably connected to the central portion of the arm e' and is moved therewith to open or close the starting-valve j' .

k' represents the valve for regulating the water-supply. Said valve is connected with the lower portion of the arm e' by a screw-threaded stem l' , passing therethrough, the arrangement being such that when the valve has been opened by the lever sufficiently to start the injector the supply of water may be regulated independently of the lever by turning said stem in the proper direction to open and close the valve-opening, as will be understood by referring to Fig. 2.

By the arrangement shown and described for operating the injector I am enabled to economize valuable space and increase the efficiency of the injector.

m' represents the waste-valve, which is operated in connection with the lever j by a connecting-rod e in a well-known manner—that is, when the lever is moved to the opposite position to that shown in Fig. 2 the valve is raised from its seat by the screw-threaded spindle n' and closed by reversing the movement, as shown in the above-mentioned figure. This valve is subjected to wear and is liable to become worn to such an extent that the movement of the operating-rod is not sufficient to seat it, and hence it becomes leaky, which in cold weather is a great inconvenience.

To obviate the foregoing objections, I have constructed the valve m' separately from the spindle n' and have secured said valve to said spindle by a screw-threaded connection, together with a jam-nut o' , so that the valve can easily be adjusted on said spindle to compensate for wear.

In arranging the pawl o in the interior of the handle I am enabled to use a comparatively short guide u . The practice has been heretofore, as in the case of the Sellers injector, to so locate the pawl as to require a much longer guide, which is an objectionable feature in devices of this class.

I claim—

1. In an injector for feeding boilers, the combination, with the casing and guide-rod, of a sleeve adapted to slide upon said guide-rod and an arm or extension formed upon said sleeve, provided with means for connecting the steam and water valves to said arm for the simultaneous operation of said valves, as set forth.

2. In an injector, the combination, with the notched guide-rod u , the sleeve d' , adapted to slide thereon, and the downwardly-projecting arm e' , formed upon said sleeve, as described, of the yoke-shaped lever adapted to operate said arm and sleeve and containing a holding-pawl in its interior, as set forth.

3. The combination, with the water-inlet of the casing and with the water-supply valve, of the threaded stem l' , connected with the lower portion of the arm e' , whereby said valve may be regulated to open and close the water-supply opening, and the sliding sleeve supporting said arm, as set forth.

4. In a boiler-feeding injector, the combination, with the necessary operative parts, including the casing, the steam-valve, and the water-valve, of stems for said valves, located side by side and parallel with each other, an arm or yoke connecting the said stems, means for moving said arm or yoke to simultaneously adjust said valves, and means for locking the arm or yoke to hold the valves in any position to which they may be adjusted, as set forth.

5. In a boiler-feeding injector, the combination, with the necessary operative parts, including the casing, the steam-valve, and the water-valve, of stems for said valves, located side by side and parallel with each other, an operating-lever, a connection between said lever and the stems of said valves, whereby the valves may be simultaneously operated, and means for locking said lever to hold the valves in different positions, as set forth.

6. In a boiler-feeding injector, the combination, with the necessary operative parts, the casing having the steam-valve and the water-valve, of stems for said valves, located side by side and parallel with each other, the stem of the water-valve being screw-threaded at the exterior of the casing, an arm or yoke connecting the stems of said valves, said yoke having an internally-threaded socket engaged with said threaded stem, whereby the water-valve may be adjusted independently, means for moving said arm or yoke to simultaneously adjust the two valves, and means for locking the arm or yoke to hold the valves in any position to which they may be adjusted, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 26th day of March, A. D. 1892.

WALTER E. DODGE.

Witnesses:

M. W. JACKSON,
A. D. HARRISON.