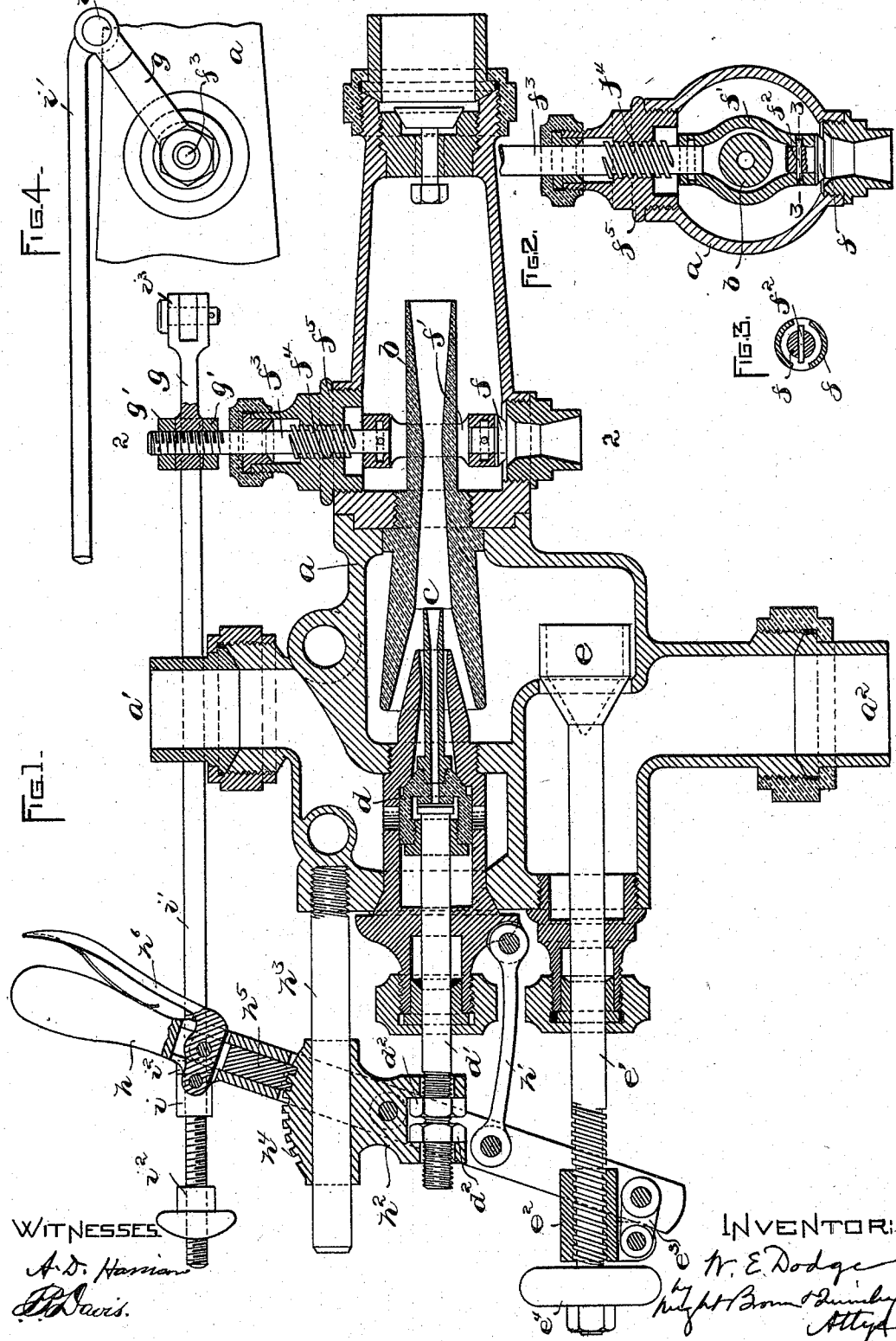


W. E. DODGE.
INJECTOR.

Patented Dec. 4, 1894.



UNITED STATES PATENT OFFICE.

WALTER E. DODGE, OF BOSTON, MASSACHUSETTS.

INJECTOR.

SPECIFICATION forming part of Letters Patent No. 530,476, dated December 4, 1894.

Application filed October 11, 1894. Serial No. 525,545. (Model.)

To all whom it may concern:

Be it known that I, WALTER E. DODGE, of Boston, in the county of Suffolk 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 such as are commonly employed on locomotives to feed the boiler, and is an improvement on the device of this kind shown and described in my former patent, No. 478,741, granted July 12, 1892.

One object is to arrange for adjustment of the waste-valve to compensate for wear without the necessity of going inside the casing. Another object of the invention is to provide an improved form of connection between the steam and waste-valves and the operating lever.

To the above ends the invention consists in a number of novel constructions and combinations of parts which are recited in the appended claims.

The accompanying drawings which form part of this specification, illustrate an embodiment of the invention.

Figure 1 shows the complete device in longitudinal section. Fig. 2 shows a section on line 2—2 of Fig. 1. Fig. 3 shows a section on line 3—3 of Fig. 2. Fig. 4 shows a plan view of part of the connections between the operating lever and the waste-valve.

The general arrangement and operation of the injector are the same as ordinarily employed, and hence a brief enumeration of the well-known features will suffice without a detailed statement of their construction and functions.

The letter, *a*, designates the casing having inlet-ports, *a'* and *a''*, for steam and water respectively; *b*, the combining cone; *c*, the steam cone; *d*, the steam-valve; *e*, the water-valve; and, *f*, the waste or surplus water-valve.

In the form of injector shown in my prior patent above referred to, the waste-valve is located at a point beyond the combining cone. Now, it is highly desirable that the injector be interchangeable with other styles of injectors and it so happens that in the fittings of a Nathan injector, the waste-water pipe comes at a place farther out than the point of location of the waste-valve in this former con-

struction of mine. To allow for this in the present case, I locate the waste-valve near the place of connection of the combining cone with the casing. This, it will be observed, brings the valve directly under the said cone, and therefore I provide the valve with a bifurcated or slotted stem, *f'*, which straddles the cone, as clearly shown in Fig. 2. There is a loose connection between the stem and valve which permits the stem to turn to a limited extent without the valve, so as to avoid the latter turning on its seat. This connection is effected by means of a pin, *f''*, entered through the shank of the valve and engaging slots in the stem. See Fig. 3.

There is a rod like portion, *f'''*, to the valve stem which is pinned to the bifurcated portion, *f'*, and is formed with a screw-thread, *f''''*, engaging a correspondingly threaded gland, *f'''''*, so that by turning the stem the valve can be seated and unseated. The upper end of the stem-member, *f'''*, is screw-threaded and receives an arm, *g*, with jam-nuts, *g'*, above and below said arm, so that said arm can be moved to different positions around the stem and locked in any of them. The object of this construction is to compensate for wear of the valve, for changing the relation of the arm and the stem changes the relation of the valve and its seat.

The operating-lever, *h*, is pivoted to a radius-bar, *h'*, which is in turn pivoted to the casing, and said lever is pivotally connected with a slide, *h''*, fitting on a guide-rod, *h'''*, projecting from the casing. Said slide is formed with a curved rack, *h''''*, on its upper side and the lever carries a pawl, *h'''''*, for engagement with said rack, and is operated by a handle, *h''''''*. The stem, *d'*, of the steam-valve is screw-threaded and passed through ears on the slide, *h''*, and is adjustably locked by nuts, *d''*, between said ears. The stem, *e'*, of the water-valve is screw-threaded and passed through a sleeve, *e''*, which is connected by a link, *e'''*, with the lever, *h*. The stem engages the sleeve loosely and a check-nut, *e''''*, on the stem beyond the sleeve provides for adjustment of the valve.

Near the upper end of the lever there is pivotally attached a sleeve or collar, *i*, which loosely embraces a rod, *i'*, carrying abutment-nuts, *i''*, on opposite sides of the collar. This

rod has a pivotal connection at, i^3 , with the arm, g .

Normally the water-valve, f , stands open, and the steam and water supply valves, d and e , are closed, as shown in Fig. 1. It will be seen that upon drawing back the lever, h , the valves, d and e , will be opened, and as the lever reaches the limit of its movement, the valve, f , will be closed.

10 What I claim as my invention is as follows:

1. In a boiler-feeding injector, the combination with the operating lever and the waste-valve whose stem is screw-threaded to engage a correspondingly formed gland so that
15 its turning seats and unseats the valve; of an arm rotatively adjustable on said stem and adapted to be locked thereon at different adjustments, and a rod connected with said arm and extending through a collar on the operating lever and having abutments on opposite
20 sides of said collar.

2. In a boiler-feeding injector, the combi-

nation of a suitably constructed casing, a guide-rod projecting therefrom, a slide on said guide-rod having a rack, an operating
25 lever centrally pivoted on a movable support attached to the casing, and pivotally connected with the slide, a pawl on said lever for engagement with the rack, a steam-valve having a stem connected with the slide, and a
30 water-valve having a stem connected with the lever on the side of its fulcrum opposite that where the slide is connected, the arrangement being such that the valve-stems are moved in
35 opposite directions and the valves open and close simultaneously.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 8th day of October, A. D. 1894.

WALTER E. DODGE.

Witnesses:

E. BATCHELDER,
A. D. HARRISON.