

(No Model.)

J. W. HEYLMUN.
Heater and Feeder.

No. 243,256.

Patented June 21, 1881.

Fig. 1.

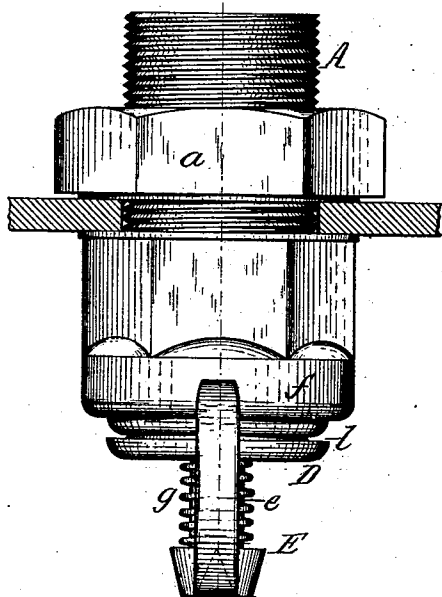


Fig. 2.

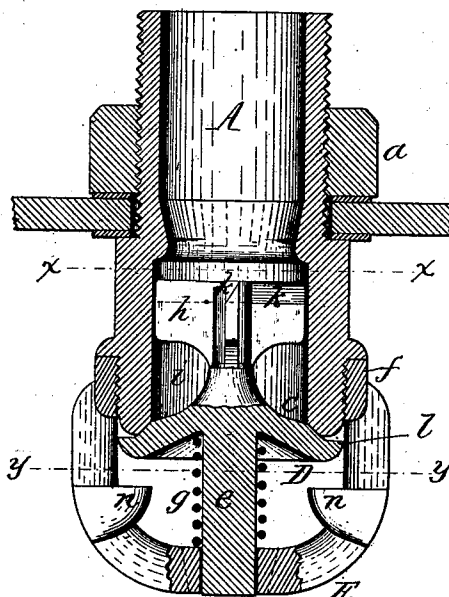


Fig. 3.

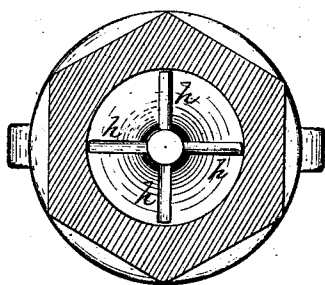


Fig. 4.

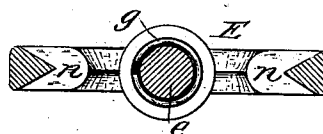
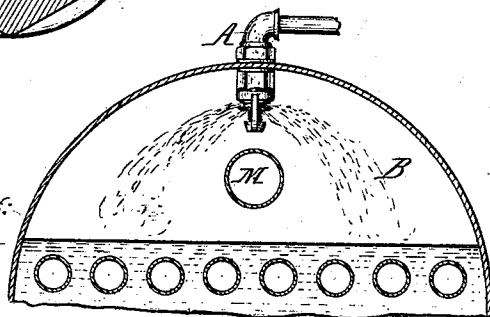


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN W. HEYLMUN, OF BUFFALO, NEW YORK, ASSIGNOR TO EDWARD J. HALL, OF SAME PLACE.

HEATER AND FEEDER.

SPECIFICATION forming part of Letters Patent No. 243,256, dated June 21, 1881.

Application filed March 22, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. HEYLMUN, of the city of Buffalo, in the county of Erie and State of New York, have invented a new and
5 useful Improvement in Feed-Water Heaters, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to that class of devices whereby the feed-water is delivered into the
10 steam-space of a boiler or feed-water heater in the form of spray and caused to descend through the steam-space in this finely-divided state, whereby it is instantly heated to the boiling-point, and the impurities contained therein
15 are caused to settle at once to the bottom, where they are discharged by a suitable blow-off.

The object of this invention is the construction of a compact and simple spray-valve located at the mouth of the feed-pipe in the steam-
20 space of the boiler or heater, whereby the water is divided into a fine spray and discharged in the proper direction, and prevented from coming in contact with the shell of the boiler or heater above the valve or the dry-pipe under-
25 neath the valve, when the latter is applied to a locomotive-boiler.

My invention consists of the peculiar construction of the spray-valve, whereby these results are attained, as will be hereinafter fully
30 set forth.

In the accompanying drawings, Figure 1 is an elevation of my improved valve. Fig. 2 is a sectional elevation at right angles to Fig. 1. Figs. 3 and 4 are horizontal sections in lines
35 *xx* and *yy*, Fig. 2, respectively. Fig. 5 is a sectional view, showing my improved device applied to a locomotive-boiler.

Like letters of reference refer to like parts in the several figures.

40 *A* represents the end of the feed-water pipe, which penetrates the top of the steam-boiler or feed-water heater *B*, as the case may be, and is secured thereto in a depending position by a screw-nut, *a*, and washers, or any other suitable means, forming a tight joint.
45

c is a valve-seat formed at the mouth of the feed-water pipe *A* in the steam-space of the boiler or heater, and *D* is a conical valve, which is arranged below the mouth of the feed-water
50 pipe and adapted to close upon the seat *c*. The

valve *D* is guided in a bail or bridge, *E*, by a stem, *e*, which projects downward from the under side of the valve through an opening in the bail. The latter is secured to the end *A* of the feed-water pipe by a threaded collar, *f*, or
55 any other suitable means.

g is a spiral spring applied to the stem *e* between the valve *D* and the bail *E*, so as to press the valve upward and return it to its seat as soon as the pump ceases to force the water out
60 of the feed-pipe. The valve *D* is guided in the mouth of the feed-water pipe by a suitable number of wings, *h*, cast in one piece with the valve, four wings being shown in the drawings. The lower portions of the wings are cut away
65 to form an unbroken annular chamber, *i*, immediately above the valve, whereby an unbroken stream of water is conducted to and discharged from the periphery of the valve-disk. The upper edges of the wings *h* are beveled
70 off at one side, as shown at *k*, whereby the stream of water passing through the pipe when the valve is depressed from its seat causes the valve to turn slightly and changes the relative position of the valve-disk and its seat every
75 time the valve closes, whereby an uneven wear of the contiguous surfaces of the valve and seat is prevented.

l represents a horizontal, or nearly horizontal, flange formed at the base of the conical
80 portion of the valve-disk, whereby the sheet or spray of water passing in a downwardly-inclined direction over the conical portion of the valve-disk is deflected and caused to be discharged in a horizontal direction. By this
85 means the spray is thrown farther from the valve and divided more finely, and the distance which it travels through the steam-space before it reaches the water-level is increased, whereby a more thorough heating of the spray
90 is effected.

The bail *E* is made wedge-shaped in cross-section, with its edge turned toward the valve, whereby the water falling on the bail is divided and deflected sidewise. The bail is ar-
95 ranged lengthwise over the dry-pipe *M*, which is placed longitudinally in locomotive-boilers, for the purpose of drying the steam as it passes to the cylinders. The wedge-shaped bail serves to deflect the comparatively cool water-spray
100

from this pipe, which latter would become chilled and the steam passing through it partially condensed if the shower of feed-water were permitted to fall upon it. *n* are lugs formed on the bail *E* for the purpose of limiting the downward movement of the valve. It is obvious that a weighted lever may be employed instead of a spring for holding the valve to its seat.

My improved spray-valve is very compact, and thereby rendered capable of being arranged in close proximity to the top of the boiler or heater, whereby the greatest possible fall of the water-spray through the steam-space is obtained, and the device adapted for use in small boilers having a proportionally small steam-space. The valve is thereby adapted for use in boilers having a dry-pipe, which latter reduces the available space to such an extent that ordinary spray devices cannot be used in such boilers. As the water issues from the valve in a horizontal direction, the water cannot come in contact with the top sheet of the boiler or heater and deposit incrustations on the same, which frequently occurs in boilers having a spray-valve which delivers the water in an upward direction.

I claim as my invention—

1. The combination, with a feed-water pipe, *A*, projecting into the steam-space of a boiler or heater in a downward direction, of a valve-seat, *c*, formed in the lower end of the pipe, a

valve, *D*, arranged below the mouth of the pipe *A*, and mechanism whereby the valve is raised to its seat when the pump ceases to eject water from the feed-pipe, substantially as set forth. 35

2. The combination, with a feed-water pipe, *A*, projecting into the steam-space of a boiler or heater in a downward direction, of a valve-seat, *c*, formed in the lower end of the pipe, a valve, *D*, arranged below the mouth of the pipe, and a guide-bail, *E*, made wedge-shaped in cross-section, whereby the spray is divided and deflected, substantially as set forth. 40

3. The combination, with a feed-pipe, *A*, of the valve *D*, provided with stem *e* and spring *g*, and the guide-bail *E*, made wedge-shaped in cross-section and provided with lugs *n*, whereby the downward movement of the valve is limited, substantially as set forth. 45

4. The combination, with a feed-pipe, *A*, provided at its mouth with a valve-seat, *c*, of the valve *D*, provided with wings *h*, having their lower portions cut away to form an unbroken annular chamber, *i*, above the valve, and their upper portions constructed with inclined or beveled faces *k*, and a deflecting-flange, *l*, arranged at the base of the conical face of the valve, substantially as set forth. 50

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Witnesses:

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