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DEVICE FOR FEEDING ANTI-INCRUSTATION COMPOUNDS TO STEAM BOILERS

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DEVICE FOR FEEDING ANTI-INCRCUSTATION COMPOUNDS TO STEAM-BOILERS.

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To all whom it may concern:

Be it known that I, HENRY W. GRAESE, a citizen of the United States, residing at Canova, in the county of Miner and State of South Dakota, have invented new and useful Improvements in Devices for Feeding Anti-Incrustation Compounds to Steam-Boilers, of which the following is a specification.

My invention relates to devices for feeding anti-incrustation compounds to steam-boilers; and its primary object is to provide a novel and highly useful device of this character wherein the compound is injected into the feed-water by means of steam fed from the boiler.

A further object of the invention is to provide a device of this character wherein the receptacle carrying the anti-incrustation compound is provided with a plunger which is adapted to be moved in one direction by steam-pressure to feed the compound and in another direction manually to refill the receptacle.

With the above-and other objects in view the invention consists in the construction, combination, and arrangement of parts hereinafter fully described, claimed, and illustrated in the accompanying drawings, wherein in the figure is a view in side elevation of a device constructed in accordance with my invention, the receptacle and a portion of the water-supply pipe being in section.

Referring to the drawing by reference-numerals, 1 designates a water-supply pipe which is connected to any suitable water-supply and to a boiler. A trap 2 is interposed in the pipe 1, and a check-valve 3 is interposed therein at a point between the trap and boiler. Secured to and rising vertically from the pipe 1 is a supporting member 4, which carries at its upper end a union 5. A steam-supply pipe 6 has one end connected to and communicating with the steam-dome of a boiler and its other end connected to and communicating with the union 5, and interposed in the steam-supply pipe 6 is a valve 7.

A receptacle which is adapted to contain a supply of anti-incrustation compound has its lower end in communication with the water-supply pipe 1 at a point intermediate the water-supply and boiler by means of a pipe 9. The pipe 9 is provided with a needle-valve 11, by means of which the supply of the anti-incrustation compound to the feed-water may be regulated. A reservoir 12 communicates at its lower end with the lower end of the receptacle 8 and is adapted to contain a supply of anti-incrustation compound and from which the receptacle is supplied therewith. The reservoir 12 is connected to the receptacle 8 by means of a pipe 13, provided with a valve 14, which is adapted to be opened to permit the receptacle to be supplied and which is adapted to be closed after the receptacle has been supplied to prevent the escape of pressure under which the anti-incrustation compound within the receptacle is subjected from forcing the same back into the reservoir 12. A plunger 15 is movably mounted within the receptacle 8 and is provided with a plunger-rod 16, which projects out through the upper end of the receptacle and by means of which the plunger may be moved to withdraw the anti-incrustation compound from the reservoir 12 into the receptacle 8. A pipe 17 communicates with the steam-supply pipe 6 and with the upper end of the receptacle 8 at a point above the plunger 15, whereby steam may be conveyed into the receptacle at a point above the plunger to cause the plunger to move downwardly and force the anti-incrustation compound through the pipe 9, valve 11, and into the water-supply pipe 1. The pipe 17 is provided with a valve 18, by means of which the steam-supply to the receptacle may be established, cut off, or regulated. A gravity-operating valve 19 is mounted within the water-supply pipe 1 and is adapted to close normally the lower end of the pipe 9, whereby water passing through the pipe 1 will be prevented from entering the receptacle 8, but which is adapted to permit the anti-incrustation compound to be injected into the pipe 1. The receptacle 8 is provided with valves 21, by means of which the condensed steam and anti-incrustation compound may be removed from the receptacle.

The operation of the device may be stated in the following manner: When it is desired to let feed-water into a boiler, the valve 20 in the water-supply pipe 1 is opened and the valves 7 and 18 in the steam-supply pipes 6 and 17 are also opened. Thereupon water passes through the supply-pipe 1 into the boiler, while steam passes through the steam-supply pipes 6 and 17 into the receptacle 8 at a point above the plunger 15. The steam-pressure above the plunger 15 causes the same to descend and eject the anti-incrustation compound contained within the receptacle into the column of water flowing through
the pipe. The quantity of anti-incrustation compound injected into the column of water may be regulated by means of the valve 11, while the pressure under which the compound is injected may be regulated by the valves 7 and 18. After the supply of anti-incrustation compound contained within the receptacle has been exhausted the valves 7, 18, and 20 are closed and the valve 14 opened, after which the plunger 15 is moved upward within the receptacle 8. This upward movement of the plunger draws the anti-incrustation compound into the receptacle 8 from the reservoir 12. After the receptacle 8 has been resupplied the valve 14 is closed and the valves 7, 18, and 20 opened, whereupon the device will again eject the anti-incrustation compound into the column of feed-water. All sediment in the feed-water will accumulate within the trap 2, from which it may be readily removed.

From the foregoing description, taken in connection with the accompanying drawing, the construction and mode of operation of the invention will be understood without a further extended description.

Changes in the form, proportions, and minor details of construction may be made within the scope of the invention without departing from the spirit or sacrificing any of the advantages thereof.

Having fully described and illustrated my invention, what I claim is—

1. In a device of the character described, the combination with a feed-water-supply pipe, of a receptacle adapted to contain an anti-incrustation compound and in communication with the supply-pipe, a needle-valve interposed between the receptacle and supply-pipe, a gravity-operating valve located within the supply-pipe to prevent water entering the receptacle from the supply-pipe, a reservoir in communication with the receptacle, a plunger movably mounted within the receptacle, a plunger-rod connected to the plunger and projecting outward from the receptacle, and a steam-pipe in communication with the receptacle at a point above the plunger.

2. In a device of the character described, the combination with a feed-water-supply pipe, of a receptacle containing an anti-incrustation compound and communicating with the supply-pipe, a gravity-operated valve to prevent water entering the receptacle from the supply-pipe, a plunger movably mounted within the receptacle, and a steam-pipe communicating with the receptacle at a point above the plunger.

3. In a device of the character described, the combination with a feed-water-supply pipe, of a receptacle containing an anti-incrustation compound and communicating with the supply-pipe, a gravity-operated valve to prevent water entering the receptacle from the supply-pipe, a plunger movably mounted within the receptacle, a plunger-rod secured to the plunger and extending outward from the receptacle, whereby the plunger may be manually operated to supply the receptacle from the reservoir, and a steam-pipe communicating with the receptacle at a point above the plunger to move the same to inject the compound into the supply-pipe.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY W. GRAESE.

Witnesses:
Hiram Rich,
H. H. Schulte