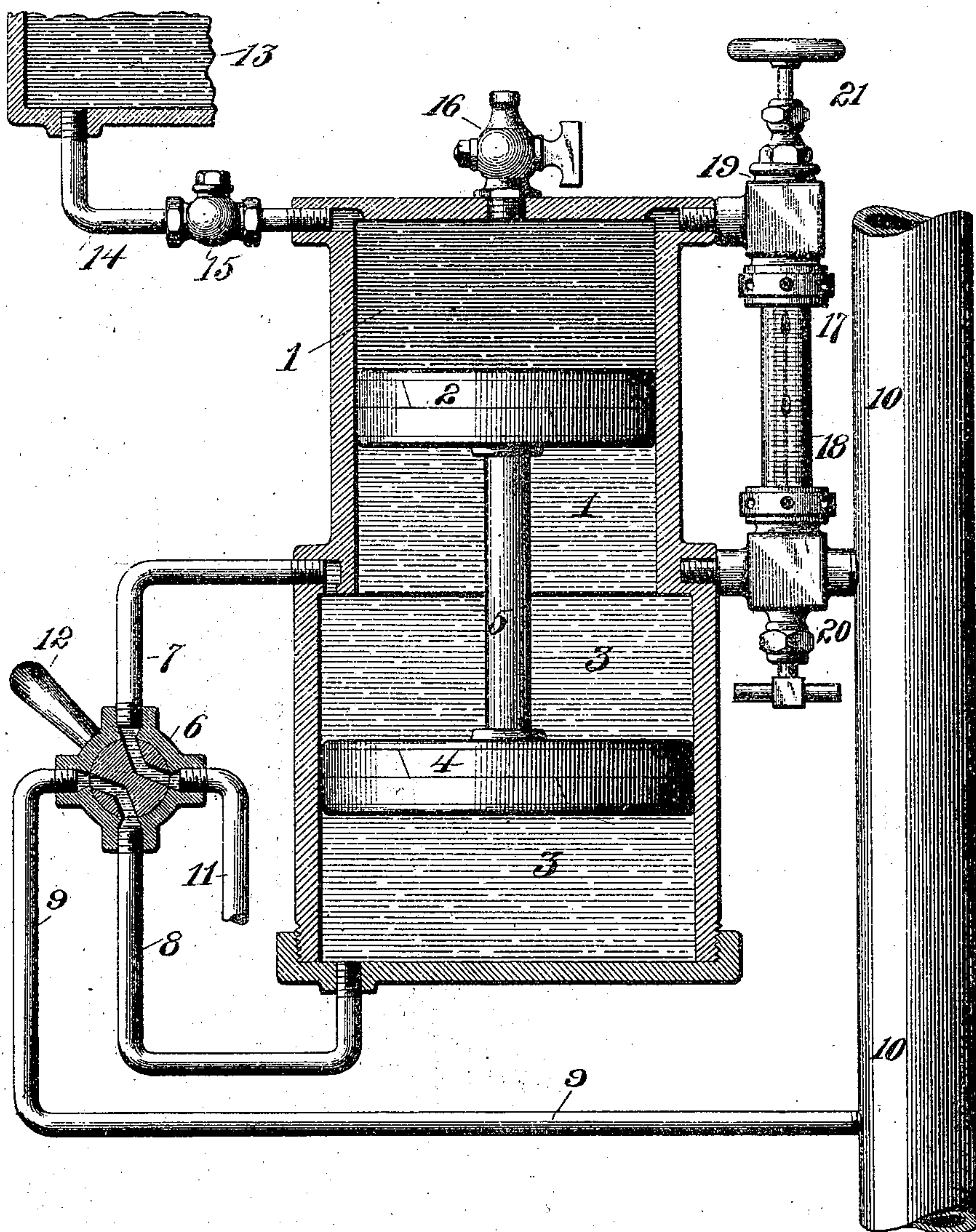


(No Model.)

C. P. HALL.
APPARATUS FOR FEEDING SCALE PREVENTIVE COMPOUNDS TO BOILERS.
No. 549,479.

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APPARATUS FOR FEEDING SCALE-PREVENTIVE COMPOUNDS TO BOILERS.

SPECIFICATION forming part of Letters Patent No. 549,479, dated November 5, 1895.

Application filed March 14, 1895. Serial No. 541,796. (No model.)

To all whom it may concern:

Be it known that I, CHESTER P. HALL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Apparatus for Feeding Scale-Preventive Compounds to Boilers; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming a part of this specification.

This invention relates to an apparatus in which the scale-preventive compound is fed to the boiler at a point between the boiler and feed-pump, so that the packing, &c., of such pump will not be exposed to the corrosive and injurious action of such compound; and the object of the present invention is to provide a simple and efficient form of apparatus by which such gradual, uniform, and continuous feed of the scale-preventive is effected, and which, in addition, embodies the features of a ready and convenient recharging of the apparatus and a visible feed of the compound in its passage from the apparatus into the feed-water pipe of the boiler. I attain such objects by an apparatus of the construction and arrangement of parts substantially as illustrated in the accompanying drawing, which represents a view thereof in sectional elevation.

In the feeding of scale-preventive compounds to steam-boilers as heretofore practiced it has been customary to feed the compound in comparatively large quantities and at long intervals into the boilers or to mix the same with the feed-water before it has passed through the feed-pump.

With the present invention the scale-preventive compound is fed in a gradual, uniform and constant manner in the form of drops to the feed-water after it leaves the feed-pump and before it enters the boilers, so as to be thoroughly and uniformly mixed with such feed-water during the passage of the same to the boiler; and the present invention admits of the feeding of any desired quantity of the scale-preventive compound in a continuous manner and in a proportionate relation to the amount of feed-water passing into the boiler.

In the carrying out of my present improved

method I make use of an apparatus such as shown in the accompanying drawing, referring to which—

1 represents a single-acting cylinder for the scale-preventive compound having a piston 2.

3 is a double-acting operating cylinder of a comparatively larger area than the cylinder 1 and provided with a piston 4, connected rigidly to the piston 2 by a connecting piston-rod 5.

6 is a reversing-valve of a usual and well known form and having port or pipe communications 7 and 8 with the respective ends of the cylinder 3, a supply-pipe connection 9 with the feed-water pipe 10, that extends from the feed-pump to the boiler, and a waste-pipe connection 11, through which the waste or exhaust takes place in the operation of the cylinder 3. The valve 6 will be provided with an operating-handle 12 for convenient operation by the engineer or other person in charge.

13 is the storage tank or reservoir for the scale-preventive compound connected, to the top portion of the cylinder 1 by a pipe-connection 14, in which is inserted a check-valve 15 to prevent a backflow of the compound from the cylinder 1 to the tank 13 in the operation of the apparatus.

16 is a pet or air cock in the top portion of the cylinder 1 to admit of the escape of air therefrom in the initial operation of the apparatus, as well as to indicate the filling of the said cylinder with the compound by a leakage of the same through such valve when open.

17 is a visible feed attachment, having a vertical glass-tube attachment 18, and which is connected at top with the top of the cylinder 1 by a connection 19 and at bottom with the feed-water pipe 10 by a connection 20. This visible feed attachment is intended to contain a body of oil in the vertical passage 17, down through which the scale-preventive compound descends by gravity in its passage to the feed-water pipe 10.

21 is a regulating-valve at the top of the visible feed attachment for regulating and controlling the outflow of the scale-preventive compound from the cylinder 1.

The operation of my improved apparatus

is as follows: In filling the apparatus the reversing-valve 6 is shifted so as to bring pressure through pipe or port 7 upon the upper side of the piston 4. The pistons 2 and 4 are thus caused to descend to their lower positions. The scale-preventive compound is thus drawn as well as forced by gravity into the upper part of the cylinder 1, a filling of the same being ascertained by opening the cock 16 to permit a visible outflow of the compound as well as any air that may be contained within said cylinder. After this the cock 16 is closed and the reversing-valve again shifted to bring pressure upon the under side of the piston 4 through pipe or port 8, the water in the upper part of said cylinder being free to escape through pipe or port 7 and exhaust-pipe 11, which are now in communication. The pressure on the under side of the piston 4 causes the same to gradually ascend, forcing the piston 2 upward in unison and displacing the compound above the piston 2 out of the cylinder 1, through the visible feed 17, into the feed-water pipe 10 in a gradual and uniform manner.

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

1. In an apparatus for feeding scale preventive compounds to boilers, the combination of a cylinder 1, provided with a piston 2, means for supplying said cylinder with the compound, a visible feed connection 17, between said cylinder 1, and the feed water pipe 10, and means for operating the piston 2, within the cylinder 1, substantially as set forth.

2. In an apparatus for feeding scale preventive compounds to boilers, the combination of a cylinder 1, provided with a piston 2, means for supplying said cylinder with the compound, the same consisting of a tank, 13, pipe connection 14, and check valve 15, a visible feed connection 17, between said cylinder 1, and the feed water pipe 10, and means for operating the piston 2, within the cylinder 1, substantially as set forth.

3. In an apparatus for feeding scale preventive compounds, to boilers, the combination of a cylinder 1, provided with a piston 2, means for supplying said cylinder with the compound, a visible feed connection 17, between said cylinder 1, and the feed water pipe 10, a waste cock 16, in the top portion of said cylinder 1, and means for operating the piston 2, within the cylinder 1, substantially as set forth.

4. In an apparatus for feeding scale preventive compounds to boilers, the combination of a cylinder 1, provided with a piston 2, means for supplying said cylinder, with the compound, the same consisting of a tank 13, pipe connection 14, and check valve 15, a visible feed connection 17, between said cylinder 1, and the feed water pipe 10, a waste cock

16, in the top portion of said cylinder 1, and means for operating the piston 2, within the cylinder 1, the outlet from the apparatus, as well, as the pressure inlet to the valve 6, being connected to the feed water pipe 10, so that a volume of the feed water will be employed to force a less volume of the compound into the passing feed water substantially as set forth.

5. In an apparatus for feeding scale preventive compounds to boilers, the combination of the cylinders 1 and 3, of different areas, pistons 2 and 4 therefor connected together, by a piston rod 5, a reversing valve 6, connected to the cylinder 3, and to the feed water pipe 10, a supply connection 14, to the upper end of the cylinder 1, and a connection between the upper end of the cylinder 1, and the feed water pipe 10, substantially as set forth.

6. In an apparatus for feeding scale preventive compounds to boilers, the combination of the cylinders 1 and 3, of different areas, pistons 2 and 4, therefor, connected together by a piston rod 5, a reversing valve 6, connected to the cylinder 3, and to the feed water pipe 10, a supply connection 14, to the upper end of the cylinder 1, a waste cock 16, in the top portion of the said cylinder 1, and a connection between the upper end of the cylinder 1, and the feed water pipe 10, substantially as set forth.

7. In an apparatus for feeding scale preventive compounds to boilers, the combination of the cylinders 1 and 3, of different areas, pistons 2 and 4, therefor, connected together by a piston rod 5, a reversing valve 6, connected to the cylinder 3, and to the feed water pipe 10, a supply tank 13, connected to the upper end of the cylinder 1, by a connection 14, having a check valve 15, and a connection between the upper end of the cylinder 1, and the feed water pipe 10, substantially as set forth.

8. In an apparatus for feeding scale preventive compounds to boilers, the combination of the cylinders 1 and 3, of different areas, pistons 2 and 4 therefor, connected together by a piston rod 5, a reversing valve 6, connected to the cylinder 3, and to the feed water pipe 10, a supply tank 13, connected to the upper end of the cylinder 1, by a connection 14, having a check valve 15, a waste cock 16, in the top portion of the cylinder 1, and a connection between the upper end of the cylinder 1, and the feed water pipe 10, substantially as set forth.

9. In an apparatus for feeding scale preventive compounds to boilers, the combination of the cylinders 1 and 3, of different areas, pistons 2 and 4 therefor, connected together by a piston rod 5, a reversing valve 6, connected to the cylinder 3, and to the feed water pipe 10, a supply connection 14, to the upper end of the cylinder 1, and a connection

between the upper end of the cylinder 1, and the feed water pipe 10, the same consisting in a down drop visible feed 17, substantially as set forth.

- 5 10. In an apparatus for feeding scale preventive compounds to boilers, the combination of the cylinders 1 and 3, of different areas, pistons 2 and 4 therefor, connected together by a piston rod 5, a reversing valve 6, 10 connected to the cylinder 3, and to the feed water pipe 10, a supply connection 14, to the upper end of the cylinder 1, a waste cock 16, in the top portion of the said cylinder 1, and a connection between the upper end of the 15 cylinder 1, and the feed water pipe 10, the same consisting in a down drop visible feed 17, substantially as set forth.

11. In an apparatus for feeding scale preventive compounds to boilers, the combination of the cylinders 1 and 3, of different areas, pistons 2 and 4, therefor, connected together by a piston rod 5, a reversing valve 6, connected to the cylinder 3, and to the feed water pipe 10, a supply tank 13, connected to the upper end of the cylinder 1, by a connection 14, having a check valve 15, and a connection between the upper end of the cylinder 1, and the feed water pipe 10, the same consisting in a down drop visible feed 17, substantially as set forth.

CHESTER P. HALL.

In presence of—

ROBERT BURNS,
GEO. H. ARTHUR.