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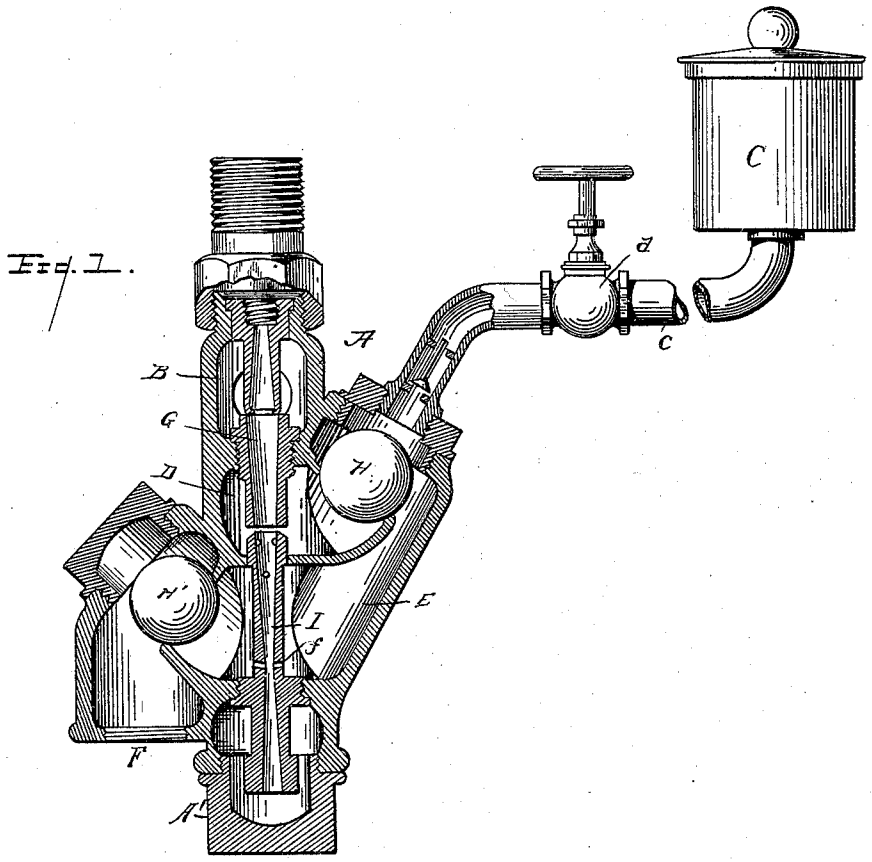
T. J. SWEENEY.

APPARATUS FOR FEEDING ANTI-INCRUSTATION COMPOUNDS TO BOILERS.

(Application filed Dec. 11, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



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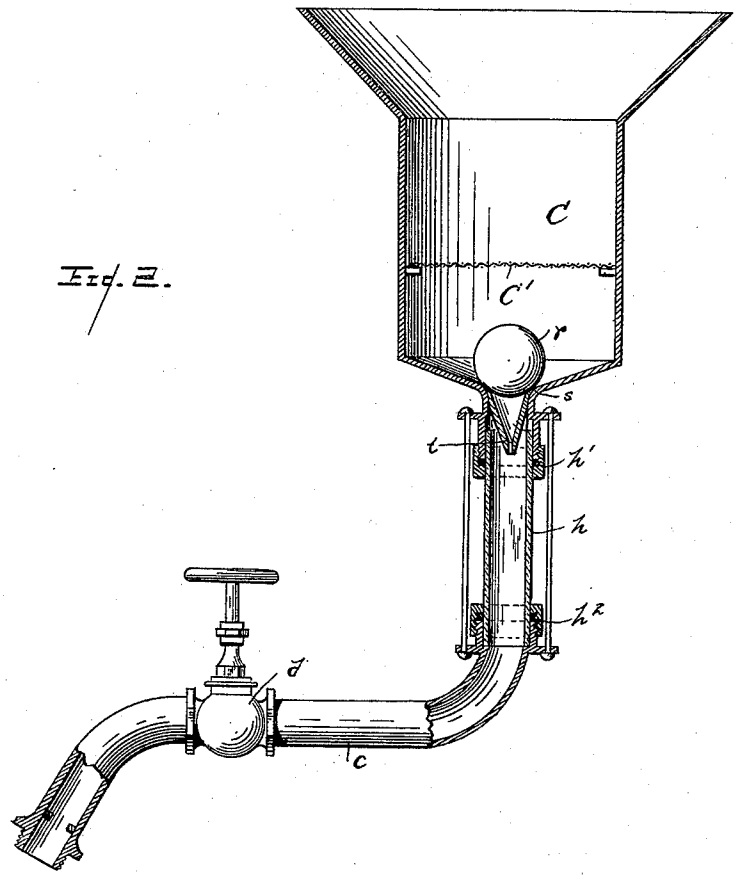
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Fig. 2.



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UNITED STATES PATENT OFFICE.

THOMAS J. SWEENEY, OF DETROIT, MICHIGAN.

APPARATUS FOR FEEDING ANTI-INCRUSTATION COMPOUNDS TO BOILERS.

SPECIFICATION forming part of Letters Patent No. 643,074, dated February 6, 1900.

Application filed December 11, 1897. Serial No. 661,486. (No model.)

To all whom it may concern:

Be it known that I, THOMAS J. SWEENEY, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Apparatus for Feeding Anti-Incrustation Compounds to Boilers; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to apparatus for feeding anti-incrustation compounds to boilers, and has for its object an improved means of introducing into boilers a substance calculated to remove scale that has been formed or to prevent the formation of scale or sedimentary deposit. I have found, experimentally, that with certain classes of injectors an attachment may be made to the injector itself so arranged as to feed into some part of the injector which communicates with the feed-water tubes that are included in the body of the injector and are known by the several terms the "jet-tube," the "suction-tube," and the "delivery-tube," and I have chosen as the injector which I wish to use to illustrate my invention the one shown and described in the patent granted October 11, 1892, to William Pemberthy; but I do not wish to confine my claim of invention to the use of a feeding device in connection with that particular injector, because similar results may be attained by the use of other injectors with feeding devices for anti-incrustation compounds properly attached thereto.

In the drawings, Figure 1 shows the feeding device attached to the injector and feeding into the waste-water or overflow chamber. Fig. 2 is a detail of a feed-tank.

A indicates the injector, which is shown in the drawings as being provided with a removable blind cap A' and which contains the several exhaust-chambers B, D, and E, the first chamber being a suction-chamber surrounding the delivery of the jet-tube and the mouth of the suction-tube, the second chamber D being a spill-chamber or overflow-chamber surrounding the delivery of the suction-tube and the mouth of the combining-tube, and the chamber E being an overflow-chamber surrounding the combining-tube, with the interior of which it has communication through a number of small openings *f*. The only outlet from the suction-chamber B is into the suction-tube G. The overflow-chamber D has leading into it at one side the suction-tube and out of it at the other side the combining-tube I. The ends of these two tubes approach closely together, but do not form a continuous tube. There is from this chamber D a second outlet leading to the overflow, and this second outlet is commonly closed by a check-valve H, (shown in the drawings as a ball-valve;) but for this ball-valve is sometimes substituted a clack or flap valve. The second overflow-chamber E also has a check-valve H' at the opening, which leads into the outflow-pipe F. When the injector is working normally, there should be no overflow, as all the water drawn into the suction-tube B should be carried through the combining-tube and into the boiler, and the check-valves H and H' should be drawn by the exhaust against their seats. This being the case, it is possible while the injector is working normally to make an opening through the case into the exhaust-chamber D or E, or inasmuch as there is a constant suction into the chamber B it is possible to lead a feed-pipe for the anti-incrustation compound into the chamber B; but inasmuch as the injector does not always work exactly normally it is necessary to provide means to prevent improper outflow or backflow of liquid—either the anti-incrustation compound or the hot water passing through the injector—and to prevent any improper backflow of liquid I place in the feed-pipe which I attach into the casing a check-valve properly located.

C indicates a suitable tank for the storage of a quantity of the anti-incrustation liquid. This may be any of the well-known anti-incrustation liquids, such as oil, potato-water, hemlock-bark water, or any other of the many liquids appropriate to the particular qualities of water used in the boiler.

The tank C may be located at any distance from the injector and is connected therewith by a pipe *c*, in which there is at a proper place a regulating-valve *d*, arranged to regulate the quantity of the liquid flowing into the boiler.

In the pipe *c*, near the place where it is attached to the injector, is a check-valve opening by gravity downward and arranged to be closed by the back pressure from the injector if at any time the injector should cease its normal work and the overflow should accumulate enough to produce back pressure.

The tank C may be above or on a level substantially with the injector, as when so located the anti-incrustation liquid would feed into the injector by gravity, or if exactly on a level or slightly above the level it would feed because of the suction of the injector. It is not desirable to rely on the suction of the injector, but rather desirable to rely upon a gravity-feed. Into whichever of the three chambers the pipe may be tapped the result will be substantially the same.

As a further safeguard I employ with the tank C a check-valve arranged to close the bottom of it when it has been emptied of liquid, and for purposes of inspection I place at the outlet of the tank C a sight-feed glass, through which the oil drops on its way to the injector.

h indicates the sight-feed glass, which is held between the gaskets h' and h^2 in a properly-formed cage that connects the end of the pipe *c*.

Across the tank C at a suitable distance above the outlet is a foraminous diaphragm which serves the double object of a strainer and a cage to prevent the float ball-valve *r* from escaping. The ball-valve *r* is adapted to close against a properly-formed seat *s*, that forms the mouth of the outlet-nozzle *t*. The float-valve *r* is light enough to float in any of the anti-incrustation liquids used and rises to the diaphragm C′ whenever the tank is filled with liquid. When the tank is emptied, the float-valve *r* falls and closes the openings into the pipe *c*. If by any chance the check-valves within the injector fail to act properly, the valve *r* will be drawn by the injector-suction to its seat.

What I claim is—

1. The combination with an injector provided with an overflow-chamber communicating with the combining-tube thereof so as to permit the return of the water from the overflow-chamber to the combining-tube, of a feed-pipe for an anti-incrustation compound arranged to deliver the compound into said overflow-chamber, and a check-valve in said pipe arranged to be operated to cut off the flow of the compound by an overflow of the feed-water into said overflow-chamber, substantially as described.

2. In combination with an injector comprising a combining-tube and a chamber surrounding the same, a feed-pipe for an anti-incrustation liquid leading to the chamber which surrounds the combining-tube and arranged to deliver the liquid in the combining-tube, a storage-tank for the liquid and an inwardly-closing check-valve adapted to close a passage from the storage-tank into the feed-pipe by the injector-suction, substantially as described.

3. In combination with an injector provided with an overflow-chamber, of a feed-pipe for an anti-incrustation compound arranged to deliver the same into said overflow-chamber, and a valve arranged to be operated to shut off the flow of the compound by an overflow of feed-water into said overflow-chamber.

4. In combination with an injector provided with a combining-tube, and an overflow-chamber surrounding said combining-tube and communicating therewith at the lower part of the overflow-chamber, of a feed-pipe for an anti-incrustation compound arranged to deliver the same into said overflow-chamber, and a valve in said feed-pipe arranged to be operated to shut off the flow of the compound by an overflow of feed-water into said overflow-chamber.

In testimony whereof I sign this specification in the presence of two witnesses.

THOMAS J. SWEENEY.

Witnesses:

CHARLES F. BURTON,

VIRGINIA M. CLOUGH.