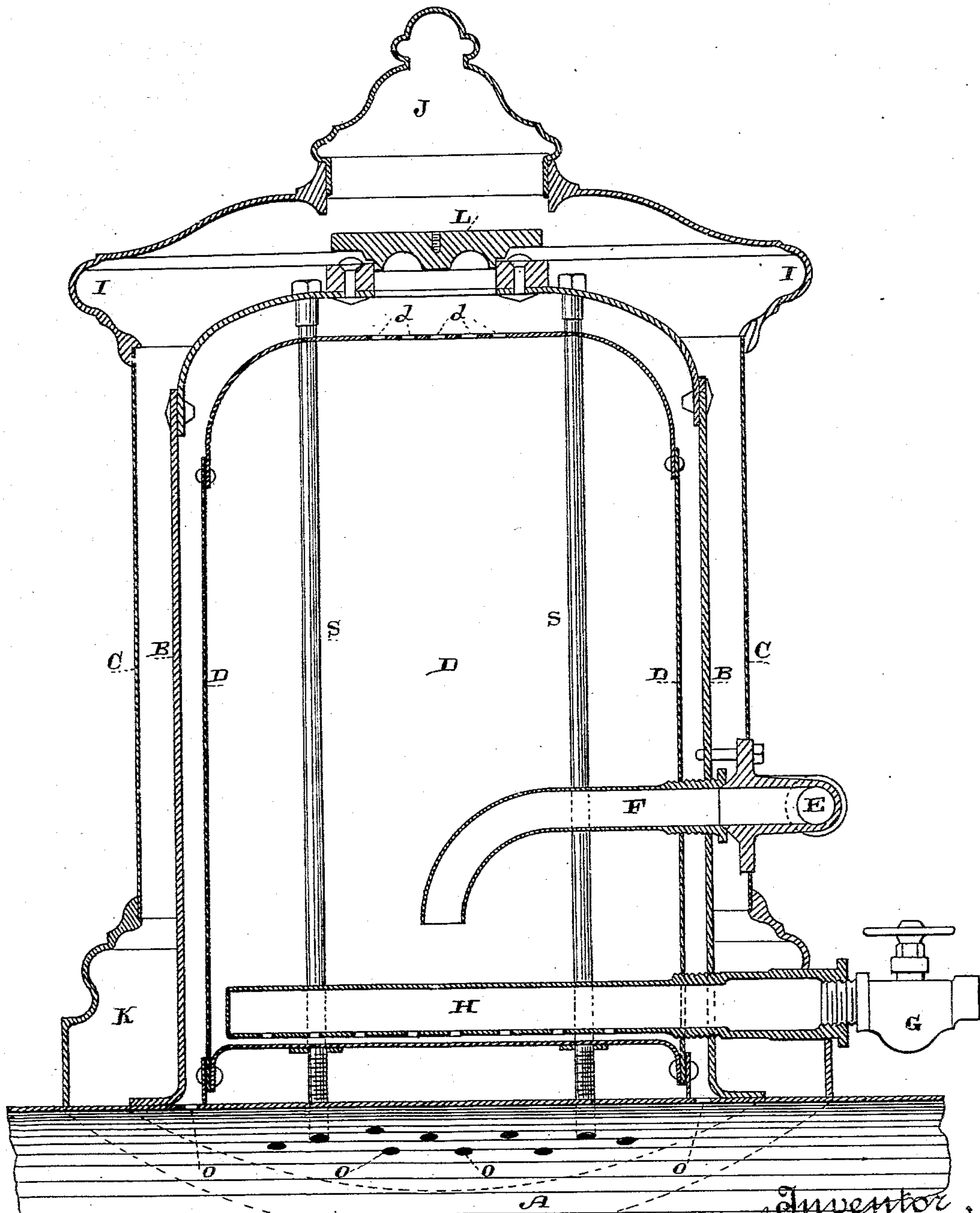


(No Model.)

A. J. STEVENS.  
FEED WATER PURIFIER.

No. 331,917.

Patented Dec. 8, 1885.



Witnesses,  
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# UNITED STATES PATENT OFFICE.

ANDREW JACKSON STEVENS, OF SACRAMENTO, CALIFORNIA.

## FEED-WATER PURIFIER.

SPECIFICATION forming part of Letters Patent No. 331,917, dated December 8, 1885.

Application filed June 22, 1885. Serial No. 169,485. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW J. STEVENS, of Sacramento, Sacramento county, State of California, have invented an Improvement in Feed - Water Purifiers; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a feed-water purifier for steam-boilers.

10 It consists of an inner shell into which water is admitted, and within which it is heated so as to rise to the top, where it passes through perforations into an exterior inclosing-shell, between which and the inner one it descends, 15 passing through holes in the bottom of the annular space into the boiler. A perforated blow-off tube extends along the bottom of the inner chamber, and through this the deposited sediment may be discharged from time to 20 time by means of a suitable cock.

Referring to the accompanying drawing for a more complete explanation of my invention, the figure is a vertical section taken through my apparatus.

25 In the present case I have shown my apparatus similar in form to a steam-dome, such as is used upon locomotive - engines and applied to the top of the boiler; but it will be manifest that the device might be made in any 30 suitable or desirable form which would preserve the conditions of its construction, and placed anywhere near the boiler, so as to be connected with its steam-space in the proper manner. The outside shell, B, of the purifier 35 is made of boiler-plate, so as to be equally as strong as the boiler. This shell is riveted, bolted, or otherwise secured upon the top of the boiler, and an inner receptacle or shell, D, is fixed within it, so as to leave an annular 40 space around its sides and a space above the top between the two. Holes O are made through the boiler A, so as to make a communication from the annular space between the shells to the interior of the boiler. Outside 45 of the whole is a casing, C, which serves to cover and protect the apparatus from air, and also to prevent condensation.

E and F are pipes through which water is pumped or injected into the interior of the 50 chamber D. H is a horizontal pipe extending into the interior chamber close to the bot-

tom. This pipe has its inner end closed, and holes or perforations are made in its lower side in close proximity to the bottom of the chamber, so that when the blow-off cock G is 55 open the sediment which has been deposited in the bottom of the chamber will be blown out through this pipe. The operation will then be as follows: Water is introduced through the pipe F into the inner chamber, 60 D. Being cold when it first enters, it will remain for a time near the bottom; but as it gradually becomes heated and is brought to the boiling-point it rises and overflows through small openings *d d* at the top of the interior cham- 65 ber or receptacle. All impurities contained or suspended in the water will be precipitated to the bottom of this chamber, from which they may be blown out through the pipe H, as before described. The purified water, after pass- 70 ing into the space between the outer and inner chambers, B and D, flows over the top of the internal reservoir and down through the annular space between the two, thence into the boiler through the openings O O. The 75 top of the outer casing, B, may have an opening and a cover, L, which can be removed at pleasure for the purpose of examining the interior. The external portion, B, of the casing is stayed by bolts S whenever it is necessary. 80 I, J, and K are ornamental portions of the exterior casing.

It will be manifest that this apparatus may be varied considerably in form without essentially altering its characteristics or opera- 85 tion.

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

1. A purifier for feed-water for boilers, con- 90 sisting of an inner chamber with a closed bottom into which the water is first received, having perforations or openings in the top, an annular or surrounding chamber into which the water enters through these openings after 95 being heated, and holes or openings at the bottom of the annular intermediate space through which the water passes into the boiler, substantially as herein described.

2. In a feed-water purifier for boilers, an 100 outer and an inner chamber secured to or connected with the boiler, and having open-

ings from the space between the two into the boiler, openings in the top of the inner chamber leading into the outer one, an inlet-pipe through which water is admitted to the inner  
5 chamber, and a blow-off pipe having perforations in close proximity with the bottom of the inner chamber, substantially as herein described.

In witness whereof I have hereunto set my hand.

ANDREW JACKSON STEVENS.

Witnesses:

BERT. ANDREW WORTHINGTON,  
GEO. R. DRIGGS.