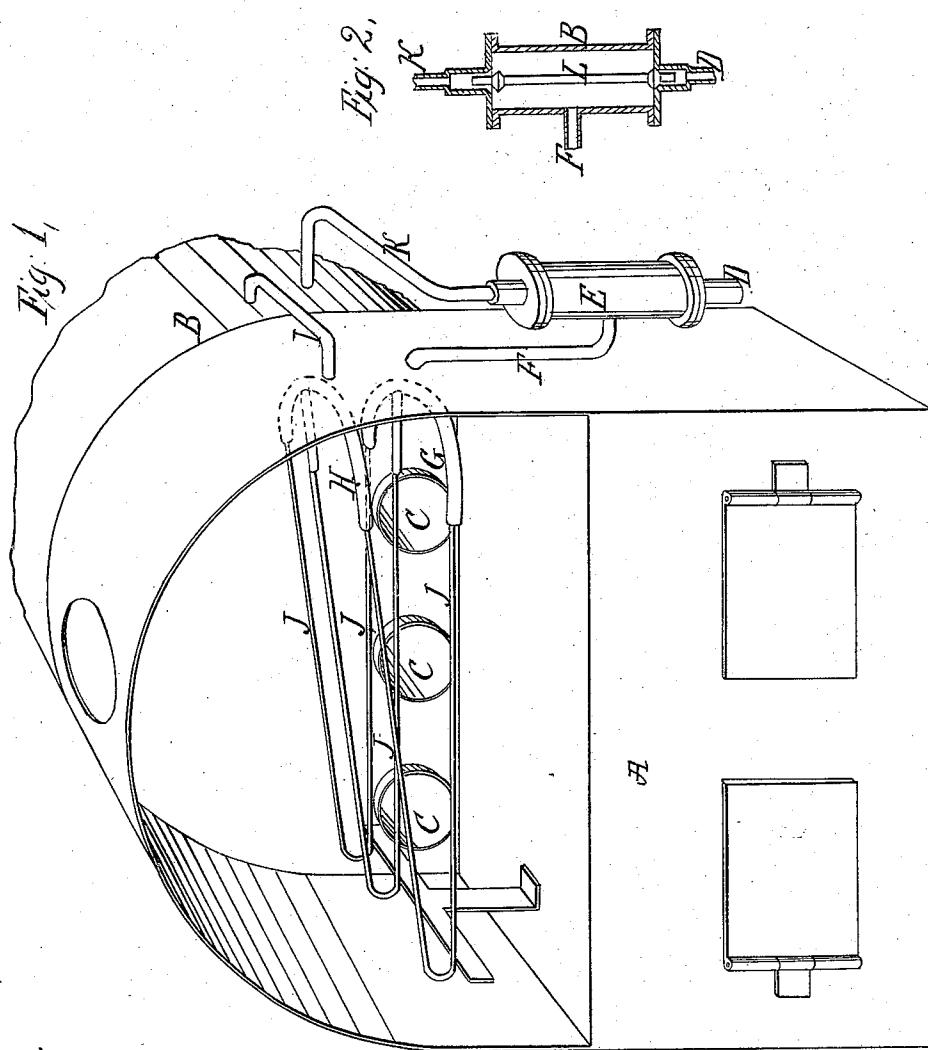


J. R. Sees,

Steam-Boiler Water-Feeder,

No 15494,

Patented Aug. 5, 1856.



Witnesses;

Francis S. Low  
W. Haskell

Inventor

John R. Sees

# UNITED STATES PATENT OFFICE.

JOHN R. SEES, OF NEW YORK, N. Y.

## HEATING FEED-WATER APPARATUS FOR STEAM-BOILERS.

Specification of Letters Patent No. 15,494, dated August 5, 1856.

*To all whom it may concern:*

Be it known that I, JOHN R. SEES, of the city, county, and State of New York, have invented an improved arrangement for heating the feed-water to steam-boilers in its passage from the feed-pump to the boiler; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying 5 drawings and to the letters of reference marked thereon, in which—

Figure 1 represents a perspective view of the front end of a low pressure return flue boiler of the ordinary construction with the 15 heating pipes arranged so as to be heated with the escape heat, and Fig. 2 a vertical section of the double acting check valve detached.

A is the front head of an ordinary return 20 flue low pressure boiler, with the upper part removed to show the arrangement of the heating pipes within the smoke box; B a portion of the body or cylindrical part of the boiler; C the front end of the return 25 flues through which the products of combustion pass on their way to the smoke box and stack or chimney; D the pipe from the feed pump, attached to the lower end of the double acting check valve chamber E; 30 F pipe from the center of the check valve chamber connecting with the lower branch pipe G of the heating pipes; H upper branch pipe of the heating pipes connected to the body of the boiler by the pipe I; J heating 35 pipes connected at their lower ends to the branch G and running to near the opposite side of the smoke box and returning back to, and connected with, the branch H. They are made of such capacity that their united 40 area shall about be equal to the area of the feed pipe D. "By thus diffusing the amount of space among the three pipes instead of confining it to one, the same body of water is presented to the heat in a much less quantity of pipe, presenting less obstruction to 45 the draft. K circulating pipe attached at one end to the body of the boiler and at the other to the top of the check valve chambers E for the purpose of creating a circulation 50 of the water of the boiler through the heating pipes J when the supply of water from the feed pump is shut off. L a double pup- 55 pet valve so constructed and placed that when the feed pump is in operation the lower one is open to permit the feed water to pass into the heating pipes J while the upper one is closed to shut off the supply of

water from the circulating pipe K, and when the feed pump stops its supply the lower valve is closed and the upper one is 60 opened to allow the water from the boiler to circulate through the heating pipes J and keep them filled to avoid the liability of their being overheated from the water being driven out of them, as would occur without 65 the circulation being kept up through them.

The pipes I and K are connected to the boiler below the lowest water line and the heating pipes J are also placed below the same line for the purpose of insuring a perfect circulation through them in the case before mentioned, it being impossible to effect that purpose when the heating or circulat- 70 ing pipes are placed or connected to the boiler above that line.

The heating pipes and their appendages may be placed in a similar manner as herein described in the smoke box of a locomotive or a direct flue boiler or in the breeching of a return flue cylinder boiler and be operated 80 by the escape heat as herein described.

By placing and arranging the heating pipes as herein described they are not sub- 85 jected to the intense heat that they would be if they were placed within the furnace or other highly heated portion of the boiler, when they are exposed to the liability of burning out and when they abstract from the heating surface of the boiler a portion 90 of the heat—in my arrangement I am en- abled to heat the feed water as hot as is de- sirable to work it with the escape heat that is otherwise valueless, resulting, as shown in practice, in a valuable economy of fuel over 95 the plan of feeding the boiler with cold or nearly cold water as ordinarily used.

I do not claim heating the feed water for boilers in pipes placed between the feed pump and the boiler neither do I claim heating the feed water by the escape heat of 100 the boiler; but

What I do claim as my invention and desire to secure by Letters Patent is—

The heating pipes J and the branch pipes G and H with the chamber containing the 105 double acting check valve L and the circulating pipe K all arranged below the water line of the boiler in the manner and for the purposes set forth.

JOHN R. SEES.

Witnesses:

FRANCIS S. LOW,  
W. V. ADAMS.