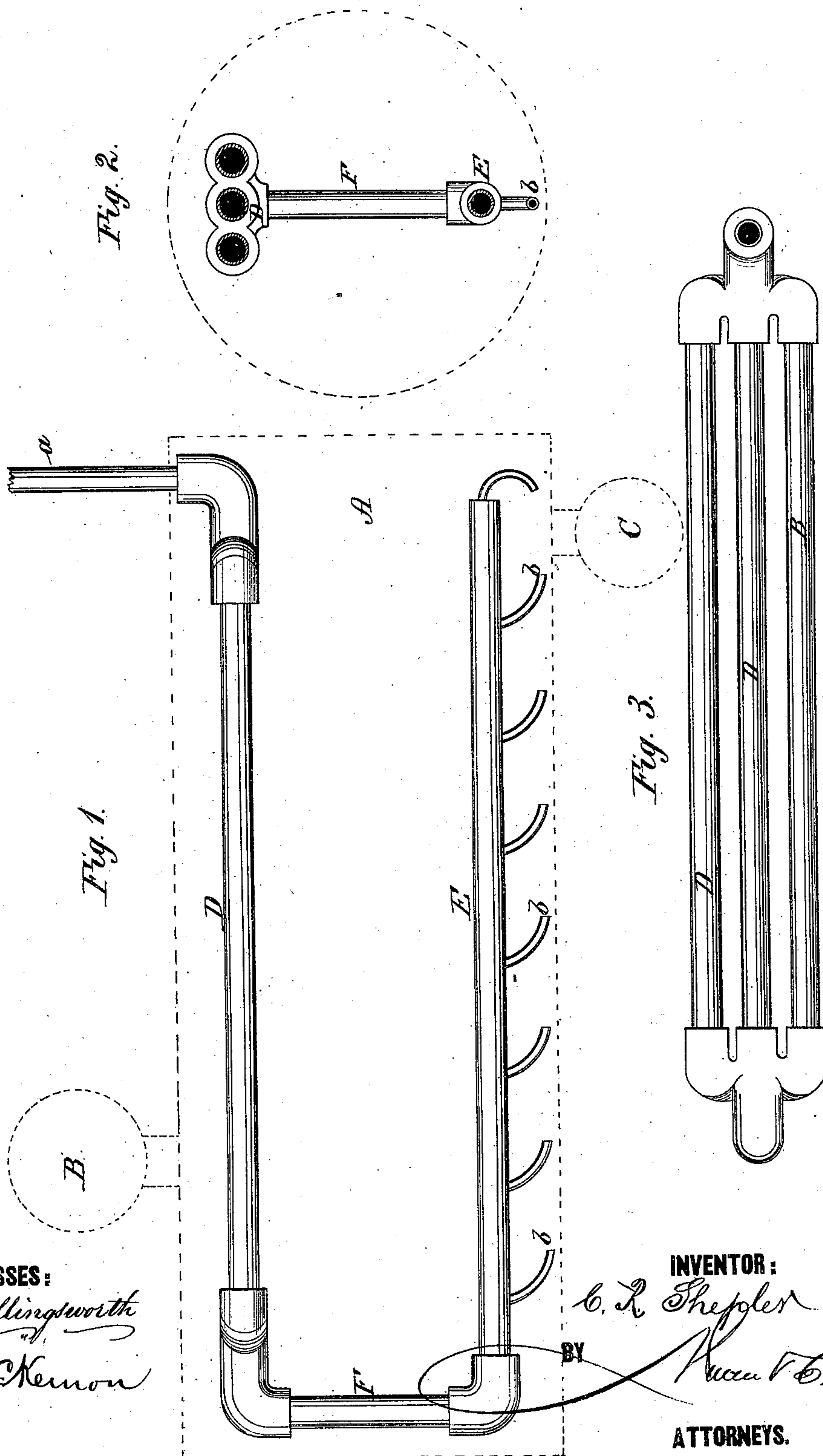


C. R. SHEPLER.
FEED-WATER HEATER.

No. 174,312.

Patented Feb. 29, 1876.



WITNESSES:
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CASSIUS R. SHEPLER, OF PORT PERRY, ASSIGNOR TO HIMSELF AND JOHN P. SMITH, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN FEED-WATER HEATERS.

Specification forming part of Letters Patent No. 174,312, dated February 29, 1876; application filed February 2, 1876.

To all whom it may concern:

Be it known that I, CASSIUS R. SHEPLER, of Port Perry, in the county of Allegheny and State of Pennsylvania, have invented a new and Improved Feed-Water Heater and Boiler-Washer, and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming a part of this specification, in which—

Figure 1 is a side view of the device, as applied to a boiler, shown in dotted lines; Fig. 2, a cross-section of the same; and Fig. 3 a plain view.

My invention relates to a novel construction of feed-water heater for steam-boilers, which is also designed to operate as a boiler-washer to prevent the accumulation of mud in the bottom of the same. It is a well-known fact that in all boilers there will be, in spite of mud-drums, an accumulation of mud in the bottom of the boiler, which prevents the water from coming into direct contact with the metal, which latter becoming very much heated frequently results in a disastrous explosion. This is especially the case with large longitudinal boilers, and boilers used upon the western rivers, where the water is always more or less impregnated with sediment.

My invention consists in a series of nozzles, arranged in the bottom of the boiler, through which the feed-water is delivered in jets against the bottom of the boiler and the metal kept clean and free from an accumulation of mud at the points where it has a tendency to settle.

The invention also consists in the peculiar construction of the feed-water heater, whereby the water is retained in the steam-space to be heated for a longer time than usual, as hereinafter more fully described.

In the drawing, A represents a longitudinal boiler of the ordinary construction, provided with a steam-dome, B, and a mud-drum, C. The feed-water heater is connected at *a* with the feed-pump, and consists of a series of pipes, D, arranged in the steam-space of the boiler, and a lower pipe, E, arranged in the bottom of the boiler parallel with the pipe D, and connected therewith through the right-angular end connection F. The pipe E is located very near the bottom of the boiler, and is provided with a series of nozzles, *b*, through which

the water is introduced in the form of jets, which impinge against and create a current along the bottom of the boiler. Said nozzles are arranged so as to direct their streams toward the mud-drums and continually wash from the bottom of the boiler all of the incipient deposits of mud which would otherwise accumulate and involve the dangerous consequences before referred to. The pipes D arranged in the steam-space are made double the capacity of the inlet-pipe *a*, and are arranged in the form of a parallel series converging into pipes *a* and E for the purpose of retarding the water in its passage through the steam-space and retaining it for a greater length of time in the same. The water entering the heater at *a* progresses slowly through the series of pipes D, because of their greater number and capacity and the resistance in the nature of steam-pressure which has to be overcome, and, instead of passing straight through the central pipe, moves slowly and with very nearly equal velocity through the whole series. The water by this means becomes more thoroughly heated before it is admitted to the boiler, thus diminishing the chances of bad effects arising from the direct contact of the feed-jets against the side of the boiler.

When the device is to be applied to a battery of boilers the same arrangement is preserved in each, the pipes *a* of each being connected by a T-joint with a single continuous feed-pipe of larger dimensions corresponding to the size and number of the boilers, the admission of water to each separate boiler being controlled at will by valves.

Having thus described my invention, what I claim as new is—

1. A feed-water heater, provided with a series of nozzles arranged to inject the water in jets against the bottom of the boiler, as and for the purpose described.

2. The combination of the series of pipes D, arranged in the steam-space, with the connecting-pipe F, and the pipe E arranged in the bottom of the boiler and provided with nozzles *b*, as and for the purpose described.

The above specification of my invention signed by me this 29th day of January, 1876.

CASSIUS R. SHEPLER.

Witnesses:

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