(No Model.)

H. STOLLWERCK.

HEATING AND FEEDING WATER TO STEAM BOILERS.

No. 301,017. Patented June 24, 1884.

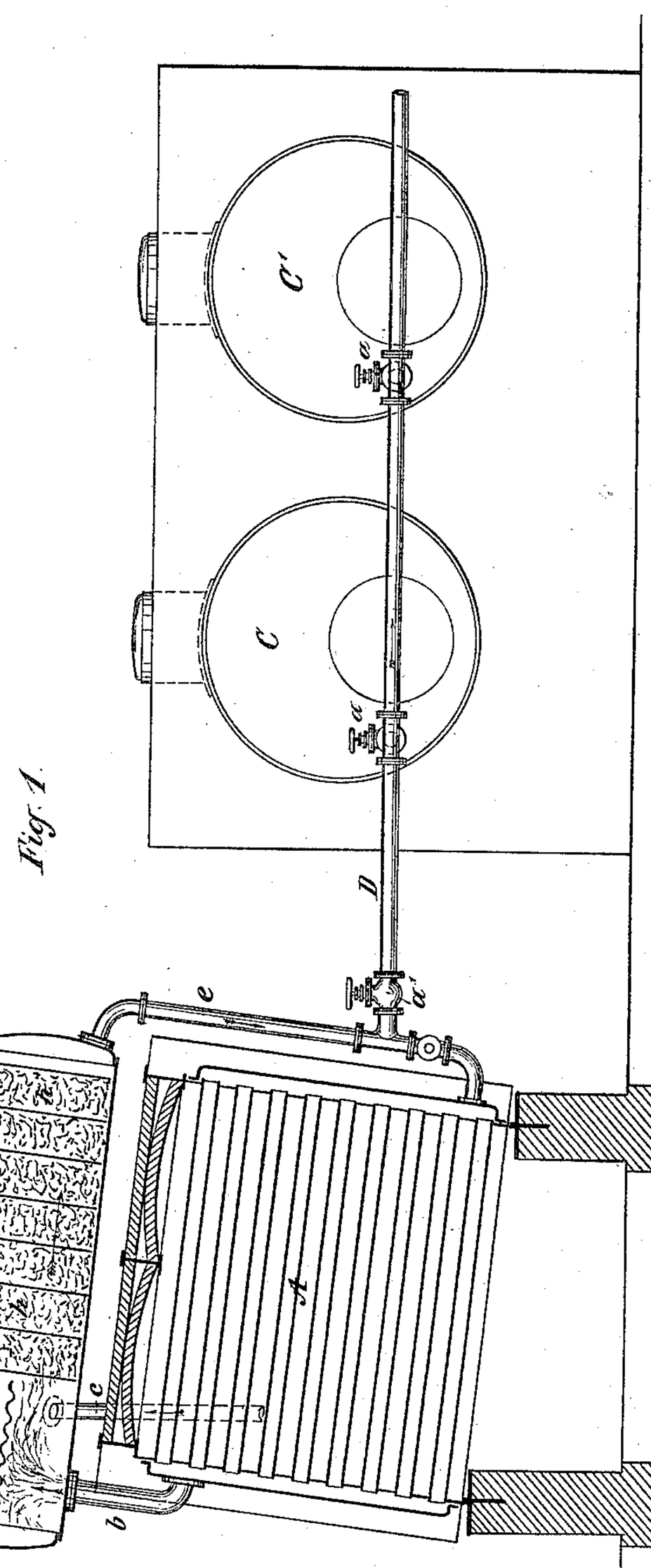

Fig. 1.

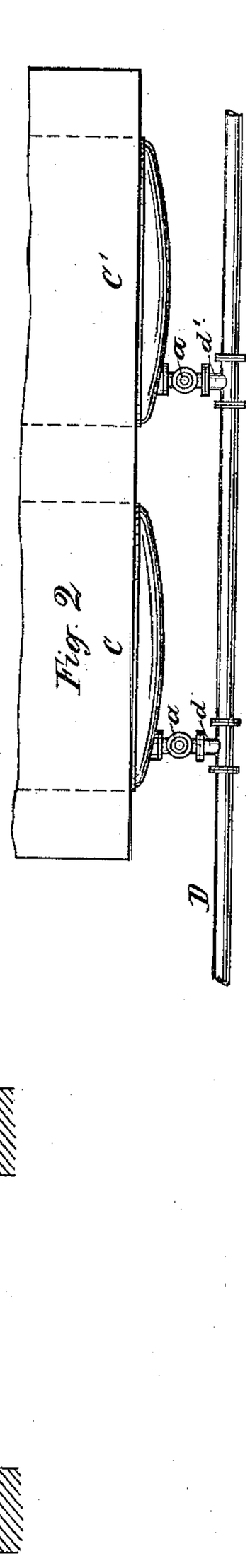

Fig. 2.

Witnesses.
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UNITED STATES PATENT OFFICE.

HEINRICH STOLLWERCK, OF COLOGNE-ON-THE-RHINE, PRUSSIA, GERMANY,
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HEATING AND FEEDING WATER TO STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 301,017, dated June 24, 1884.

Application filed February 13, 1884. (No model.)

To all whom it may concern:

Be it known that I, HEINRICH STOLLWERCK, of the city of Cologne-on-the-Rhine, in the Kingdom of Prussia and German Empire, have invented certain new and useful Improvements in Heating and Feeding Water to Steam-Boilers, of which the following is a specification, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to steam-boilers; and its object is to provide for the feeding, with feed-water freed from its incrustation, of steam-boilers, such as Cornish or other cylindrical boilers, circular boilers having boiler-tubes, tubular boilers, or steam-boilers of any other suitable construction from a tubular or other equivalent boiler having a sufficiently higher pressure than that prevailing in the said boiler or boilers to be fed with the said feed-water free of incrustation, and also to provide means for effecting the said feed of water from the said boiler of higher pressure to the said boiler or boilers of lower pressure, so as to cause the feed to be either continually or periodically, and to allow of being readily regulated.

To enable others skilled in the art to better understand the nature of my invention, I will now proceed to describe the same, reference being had to the accompanying drawings, in which—

Figure 1 shows a tubular boiler provided with a device for freeing feed-water from its incrustation, and combined with a number of Cornish or cylindrical boilers to be fed from the said tubular boiler with feed-water free of incrustation, while Fig. 2 shows the connection of the cylindrical boilers with the connecting-pipe from the tubular boiler.

A is the tubular boiler.

B is the device or depositing-chamber employed for freeing feed-water from its incrustation.

C C′ are the cylindrical or other boilers to be fed from the boiler A with feed-water free of incrustation, and D is a pipe connecting, by means of the branches *d d′*, the said boiler A with the said boiler or boilers C. The branches *d* are provided with suitable cut-off valves, *a*, while the pipe D has the main cut-off valve *a′*.

The tubular boiler A is suitably connected with the device or depositing-chamber B substantially in the same manner as described by me in my United States Patent No. 272,347, of February 13, 1883, so that no particularly-detailed description will be required for this part of the arrangement shown in the drawings. The feed-water enters the chamber B through the feed-water-inlet pipe *c*, and is met by the circulating mixture of steam and hot water ejected from the tubular boiler A through the steam-inlet pipe *b*, said circulating mixture forcing the fresh feed-water with reduced velocity through a number of suitable filtering-plates or equivalent filtering media, *h*, of any convenient material, whereby the incrustation contained in the said feed-water is separated from the latter and retained by the said filtering media, while the purified feed-water, mixed with the said water of circulation, passes on and enters the boiler A through the pipe *e*. I wish to state here that I do not confine myself to apply sieve-like plates in the chamber B for the purpose of filtering the feed-water and freeing the same from its incrustation, as stated in my former patent hereinbefore referred to, and I propose to substitute for such perforated plates any equivalent filtering material of suitable nature and construction—such as hurdle-work of thorns, wire grate, coarse sack-cloth, basket-work, or any other equivalent material adapted to retain the said incrustation of the feed-water when the latter is met and carried along through the said filtering media by the circulating mixture of steam and hot water ejected from the boiler A. The latter, being thus continually fed with feed-water practically free of incrustation, has a higher pressure than the boiler or boilers C, which, as hereinbefore described, are connected with the said boiler A by means of the pipe D, having the main cut-off valve *a′* and the branches *d d′*, provided with the cut-off valves *a a*. Now, in order to effect the feeding of the said boilers C having the lower pressure with purified feed-water from the boiler A having the higher pressure, I proceed as follows—that is to say, if, for instance, the boiler C′ require feeding, I open the valve *a′* in the main and the valve *a* in the branch *d′*, so as to cause the required quantity of the purified water in the boiler A to be pressed over through the pipes

D and *d'* into the boiler C' by means of the higher pressure prevailing in the said boiler A as compared to that existing in the boiler C'. After the feeding of the boiler C' has been completed the said valves are shut again, and the same operation will take place with regard to boiler C by opening the valve *a'* of the main and the valve *a* of the branch *d*. Instead of such periodical feeding, it will be seen that the feeding may also take place continually if the said valves *a'* and *a* are made adjustable and provided with graduations, so as to allow of regulating the inflow of purified feed-water from the boiler A into the boiler or boilers C in proper proportion to the consumption of steam in the said boiler or boilers C. It will also be seen that this improved method of feeding boilers with feed-water free of incrustation allows of readily combining with cylindrical or any other equivalent boilers such devices for freeing feed-water from its incrustation whose appliance otherwise to the said boilers would have been impossible, or most difficult, while by means of the adjustable connection described of the said boilers with the high-pressure tubular or other equivalent boiler a ready appliance of such purifying devices to boilers of any construction is insured without there being any changes required as concerns the construction, foundation, or mode of working of such boilers.

I wish it to be distinctly understood that I do not confine the application of my improved method to boilers of any particular construction, nor to the manner in which the high-pressure boiler is provided with the feed-water free of incrustation.

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

The combination, substantially as herein described, of the high-pressure boiler A, and the low-pressure boiler or boilers connected with the lower part of the former, with the filtering-chamber B, for receiving the feed-water, a connection, *e*, between one end of the filtering-chamber and the lower part of the high-pressure boiler, and a connection, *b*, between the upper part of the latter and other end of the filtering-chamber, for the passage of steam and hot water into the filtering-chamber to force the feed-water through the latter to the high-pressure boiler, the combination being to feed the low-pressure boiler or boilers from the high-pressure boiler with feed-water free from incrustation, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HEINRICH STOLLWERCK.

Witnesses:

SAMUEL SPARKMAN,

TH. PEITMANN.