(No Model.) 2 Sheets—Sheet 1.

G. DÜRR.

STEAM GENERATOR.

No. 497,233. Patented May 9, 1893.

Fig. 3.

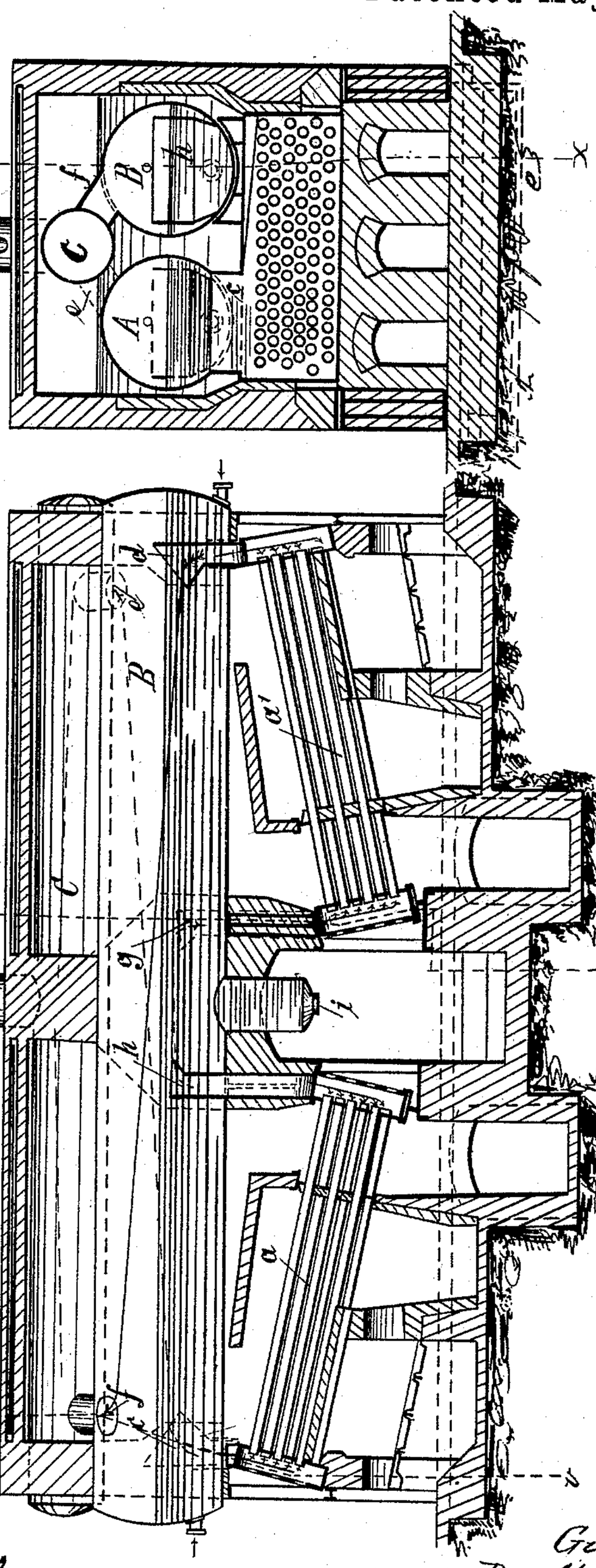

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 1.

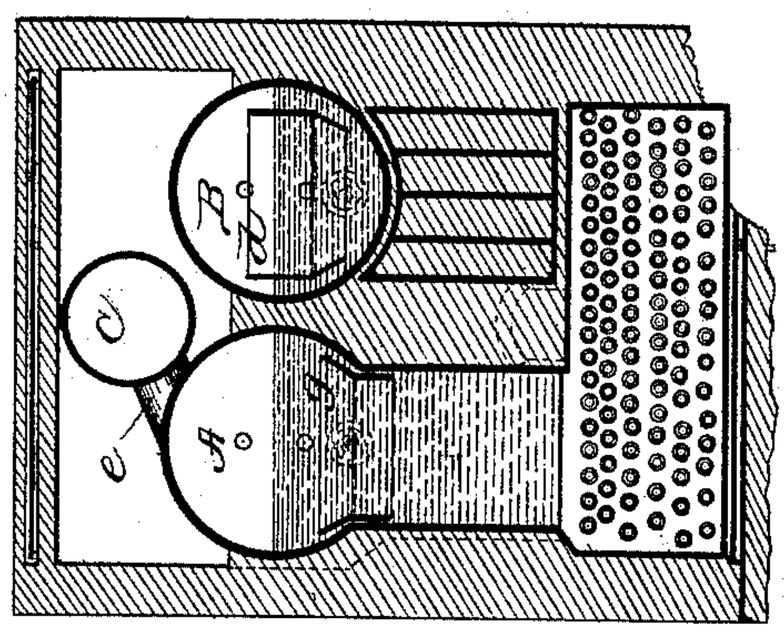
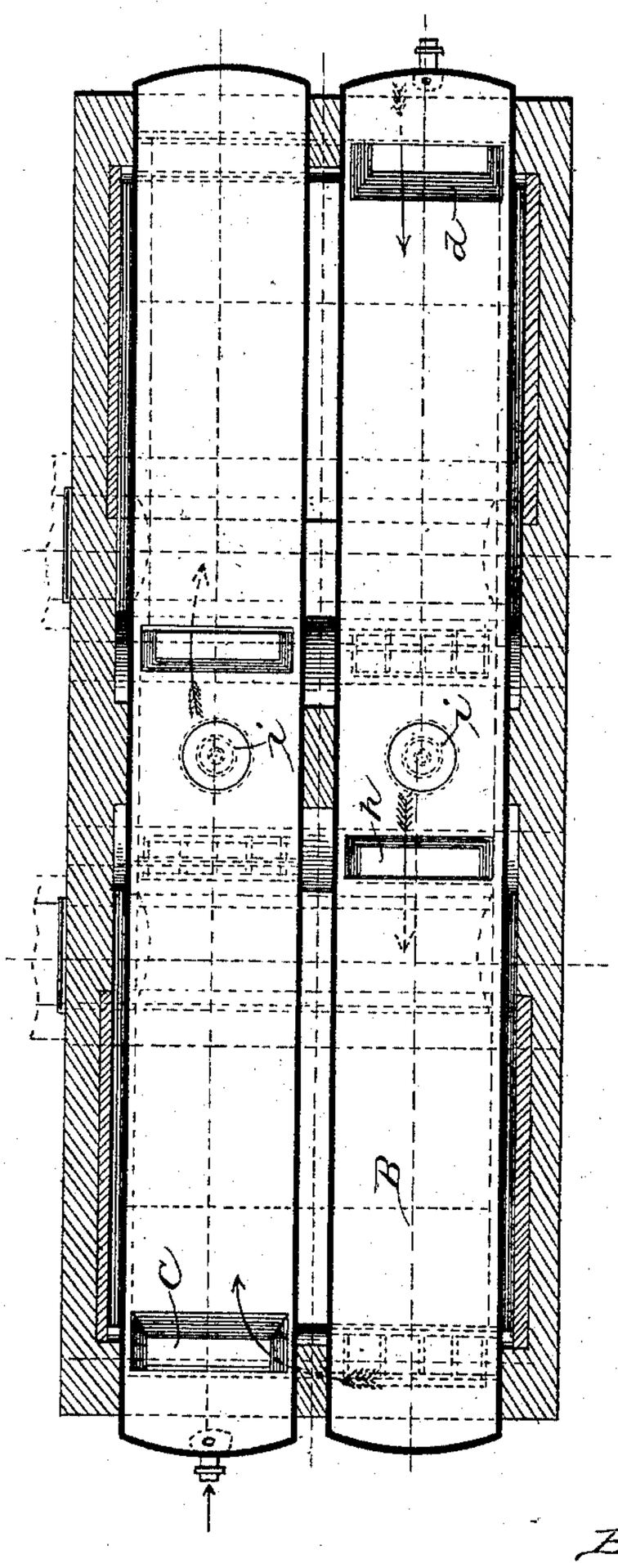


Fig. 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

GUSTAV DÜRR, OF DUSSELDORF, GERMANY.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 497,233, dated May 9, 1893.

Application filed January 21, 1891. Serial No. 378,613. (No model.) Patented in Belgium November 22, 1890, No. 92,824, and in England November 25, 1890, No. 19,082.

To all whom it may concern:

Be it known that I, GUSTAV DÜRR, manufacturer, of Ratigen, Dusseldorf, in the Kingdom of Prussia and German Empire, have invented a new and useful Improvement in Steam-Generators, (for which I have received Letters Patent in Great Britain, No. 19,082, dated November 25, 1890, and in Belgium, No. 92,824, dated November 22, 1890,) of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to the construction of water tube boilers and it has for its object to provide as great a heating surface in a boiler as possible, the arrangement comprising two separate water tube boilers or heaters having separate fire-places, which are placed below and combined with ordinary boilers.

In the drawings—Figure 1 is a vertical longitudinal section of my invention, on line *x*—*x*, Fig. 3. Fig. 2 is a central sectional plan thereof through the boilers A and B, and Figs. 3 and 4 are transverse sections taken on the lines *v*—*w*, and *y*—*y* respectively of Fig. 1, looking to the right.

My invention as shown in Fig. 1 consists of two sets of inclined water-tubes *a a'* with separate fire-places opposite each other in the furnace, each set of tubes being connected to water chambers and the whole of them operating in common with an arrangement of upper boilers A B and the steam dome C. The water tube boiler *a* shown on the left in Fig. 1, communicates with the upper boiler A through the tubular stay *c* projecting upward within the boiler A and with the boiler B through *h*, while the water tube boiler *a'* on the right, in Fig. 1 communicates with the upper boiler B through the stays *d*, also projecting upward within the boiler B and with the boiler A through *g*. From the boilers A and B the steam generated, passes through the tubes *e* and *f* into the steam dome C which also acts as a superheater and from whence the steam is served through the connections K. With this arrangement of tubular stays it follows that the water, fed at *i* into the dome C and from there into the upper boiler B, together with that, which has not been altogether converted into steam passes through the stay *h* and into the series of tubes *a*, arranged on the left-hand side and is discharged into the upper boiler A through the stay *c* whence it passes through the stay *g* into the series of tubes arranged on the right side and thence through the stay *d* into the boiler B and vice versa when the water is fed into the boiler A the steam generated in both being conveyed to the steam dome or drum C through the pipes *e f*.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination of a suitable furnace, two boilers A, B, supported therein, and the two series of water-tubes *a*, *a'* supported beneath said boilers, each series of water-tubes being connected with the boilers whereby a continuous circulation of the water can be had through both boilers and both series of water-tubes, substantially as set forth.

2. The combination of a suitable furnace provided with fire boxes at its opposite ends, two boilers supported in said furnace and extending from end to end, two series of water tubes supported respectively over the fire-boxes, each series of said water-tubes being connected with both of said boilers, substantially as and for the purpose set forth.

3. The combination of the two boilers A, B, supported in a suitable furnace, with the series of inclined water-tubes *a* arranged under the boilers and connected at their upper ends to the boiler A, and at their lower end to the boiler B, and the series of water-tubes *a'* connected at their upper ends to the boiler B, and at their lower ends to the boiler A, substantially as and for the purpose set forth.

4. The combination with two boilers A, B, and the furnaces; of two series of tubes *a*, *a'* arranged under said boilers, and the tubular stays *d c*, leading from the tubes *a*, *a'*, and projecting upward within the boilers A, B, the tubular stays *g*, *h*, also connecting the boilers with said tubes *a*, *a'*, and the stays *e*, *f*, connecting said boilers to the dome C, substantially as set forth.

In witness whereof I hereunto set my hand in presence of two witnesses.

GUSTAV DÜRR.

Witnesses:

D. J. PARTELLO,

C. SCHMIEDING.