

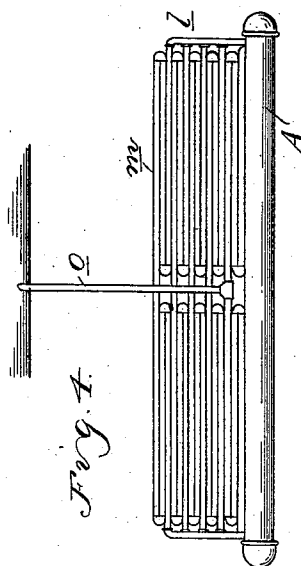
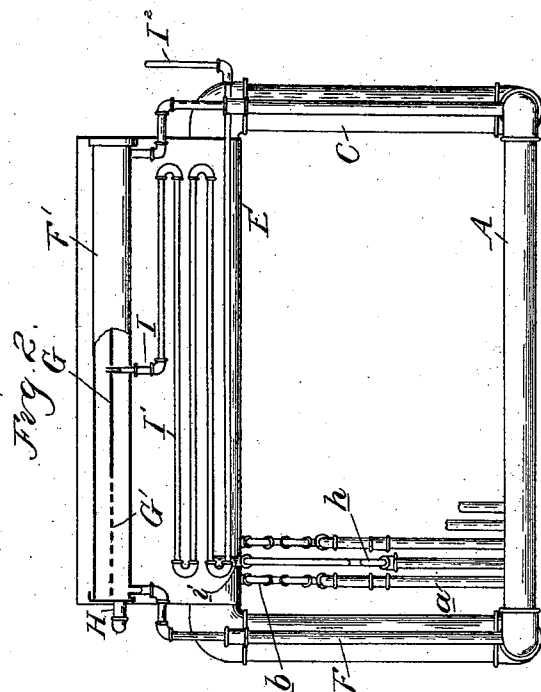
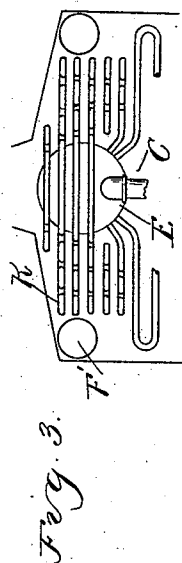
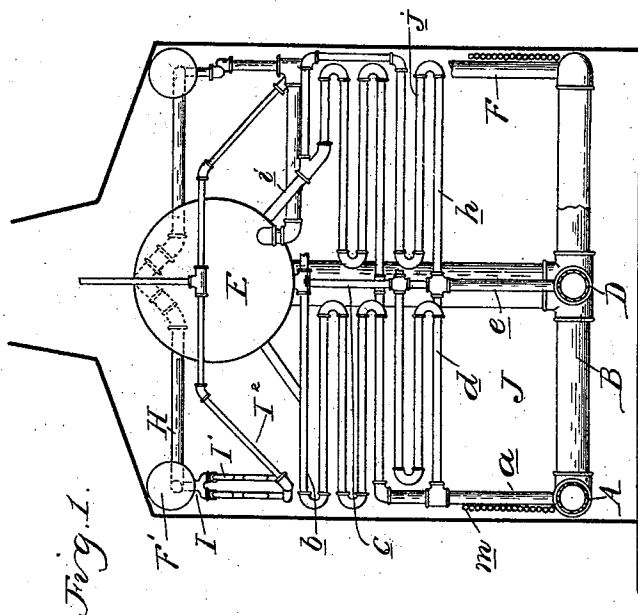
(No Model.)

2 Sheets—Sheet 1.

A. C. DEARING.
STEAM GENERATOR.

No. 543,678.

Patented July 30, 1895.



Witnesses
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(No Model.)

2 Sheets—Sheet 2.

A. C. DEARING.
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Fig. 5.

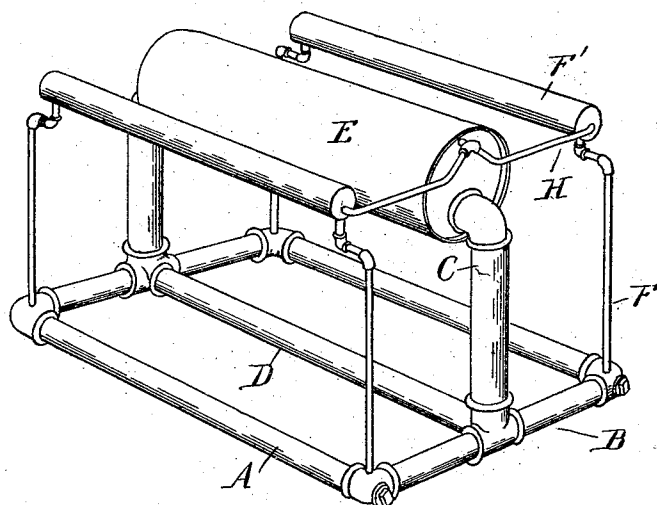


Fig. 8.

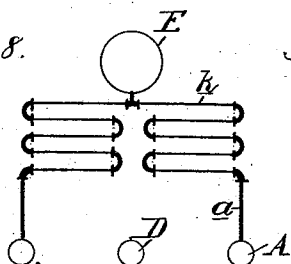


Fig. 9.

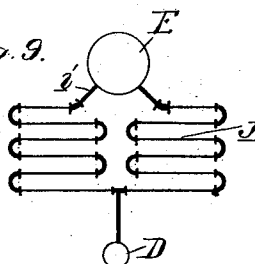


Fig. 6.

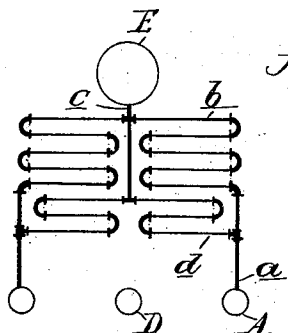
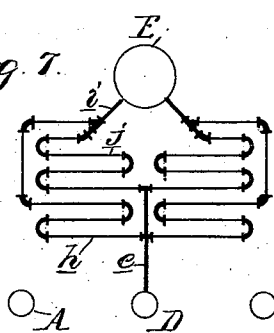


Fig. 7.



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UNITED STATES PATENT OFFICE.

ANSON C. DEARING, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-HALF TO
JACOB SIEGEL, OF SAME PLACE.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 543,678, dated July 30, 1895.

Application filed January 21, 1895. Serial No. 535,709. (No model.)

To all whom it may concern:

Be it known that I, ANSON C. DEARING, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Steam-Generators, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention consists in the construction of the pipe-frame and the circulating water-pipes of a steam-generator, whereby I obtain a strong, simple, and effective construction, all as more fully hereinafter described.

In the drawings, Figure 1 is a front elevation of my improved boiler, the boiler front being removed to show the construction of the piping, the feed-water coils being omitted. Fig. 2 is a side elevation thereof, partly in section. Fig. 3 is an elevation of the upper part of the boiler, showing the arrangement of the feed-water coils. Fig. 4 is a side elevation similar to Fig. 2, showing the side circulating coils. Fig. 5 is a perspective view showing the construction of the pipe-frame. Figs. 6 and 7 are diagram elevations illustrating the construction of the looped circulating-coils. Figs. 8 and 9 are similar diagrams illustrating a slightly-modified construction of these coils.

The pipe-frame of my boiler comprises the side pipes A and the end pipes B, horizontally arranged, the end pipes being centrally connected together by the connecting-pipe D, the whole forming a substantially-rectangular rigid base-section.

Centrally of the end pipes are the vertical risers C, which at their upper ends connect into the water-space in the ends of the main drum E. At each corner of the base-frame are the vertical risers F, which connect into the bottom of the side or auxiliary steam-drums F'. These steam-drums F' are divided by the horizontal partitions G, which at points are provided with the perforated sections G'.

H are connecting-pipes from the top of the steam-drum E to the lower part of the steam-drums F'.

I are the steam-outlet pipes or steam-sup-

ply pipes from the top of the side steam-drums F'.

I' are superheating coils arranged vertically below the side steam-drums, as plainly shown in Fig. 1, preferably comprising a multiple arrangement, as shown in that figure, the superheating coils from the two side drums being connected together by the pipes I² and leading out in a common pipe.

The circulating water pipes or coils connect the base-pipes with the main steam-drum, and these circulating pipes are preferably of the construction shown in Figs. 6 and 7 alternately.

The construction shown in Fig. 6 comprises the risers a from the side pipes A, having at their upper ends the inwardly-extending loops b, which connect into a central riser c, which in turn connects into the bottom of the drum E. The risers a, below the loops b, have the double loops d, connecting into the bottom of the risers c, making a short circuit from the riser a, directly over the fire into the bottom of the drum.

Every alternate coil is of the construction shown in Fig. 7, comprising the riser e, connected into the pipe D of the base, having on opposite sides the double-loop coils h, which connect into the pipes i, which in turn lead into the sides of the drum.

At the top of the riser e are the looped coils j, which likewise connect into the pipe i. In this case also the lowest loops h have a direct connection with the steam-drum, so that the fastest circulation may be through the shortest course in the hottest part of the furnace.

Instead of the construction of coil shown in Figs. 6 and 7, I may use that shown in Figs. 8 and 9, in which the risers a at the top connect into the loops k, which connect into the base of the drum, the alternate coils being the same as shown in Fig. 7, (with the omission of the lower coils h connecting directly into the drum,) in which case the coils j are made more numerous. On each side and at the back over the side pipes A, and opposite the combustion-chamber J of the furnace, I arrange circulating-coils constructed as follows: l are risers at each end of the pipes A exte-

riorly of the pipes *a*. From these risers extend a series of looped coils *m*, which connect at the opposite end into the central riser *O*, which in turn connects into the bottom of the main drum.

Kare feed-water coils arranged between the side drum and the main drum above the circulating water-pipes, as shown in Fig. 3.

The coils *m* at the sides and rear of the furnace practically form a looped water-jacket on three sides of the furnace-chamber.

The use of the perforated diaphragm *G* insures only the use of dry steam which is superheated before it is delivered from the boiler in the coils *I'*.

What I claim as my invention is—

1. In a boiler, the combination of a pipe frame comprising a rectangular base, a central connection between the end pipes thereof, vertical risers centrally of the end pipes, a steam drum into the ends of which these risers connect, vertical risers at the corners of the base, steam drums into the ends of which these corner risers connect, connection between the side and main steam drums, and looped circulating pipes connecting the side base pipes and the central connecting pipe alternately with the main drum, substantially as described.

2. The combination with the side pipes *A* and the drum *E*, of the risers *a* from those side pipes on opposite sides, the looped coil *d* springing from the risers on opposite sides, the central riser *c* into which these coils connect and which connects into the bottom of the steam drum and the opposite looped coils *b* connecting from the top of the risers *a* into the top of the steam drum, substantially as described.

3. In a boiler, the combination of the rect-

angular pipe base, the connecting pipe *D*, centrally joining the ends thereof, the risers *C* at the ends of said pipes, the drum *E* in the end of which the risers *C* connect, the intermediate risers *e* on the connecting pipe *D*, the lower looped coil *h* on opposite sides of the riser *e* the looped coil *j* at the top of the riser *e* and the pipes *i* through which the pipes *e, j* communicate with the drum *E*, connecting into the drum, substantially as described.

4. In a boiler, the combination of the horizontal pipe base and the steam drum *E* connecting therewith, of the risers *l* at the ends, of the side pipes thereof, a series of looped coils *m* connected at one end into said risers and at the other end into a central riser, and said central riser connected into the steam drum, substantially as described.

5. In a boiler, the combination of the pipe frame, comprising the rectangular base, a central connection between the end pipes thereof, vertical risers centrally of the end pipes and steam drum into which the ends of these risers connect, vertical risers at the corners of the base, steam drums at the sides into the ends of which these corner risers connect, connecting pipes between the side and the main steam drum, a perforated diaphragm in the side steam drums, a steam supply pipe leading from above said diaphragm, superheating coils *I'* forming a continuation of said supply pipe and connection between the superheating coils, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ANSON C. DEARING.

Witnesses:

M. B. O'DOHERTY,
L. J. WHITEMORE.