

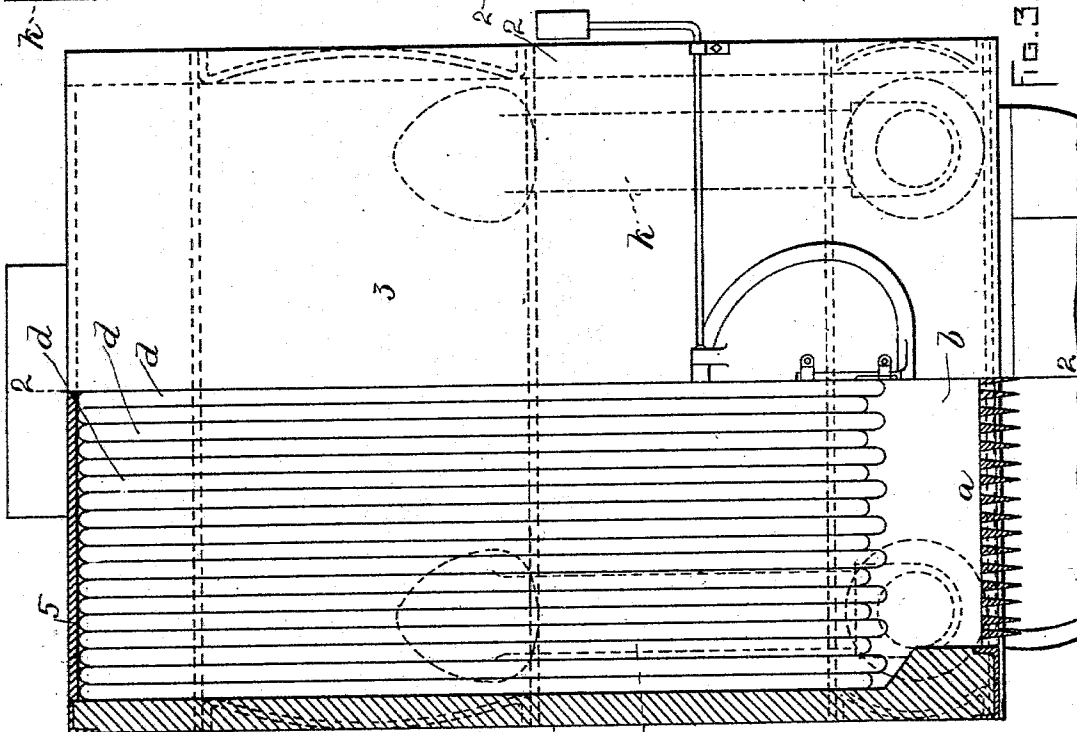
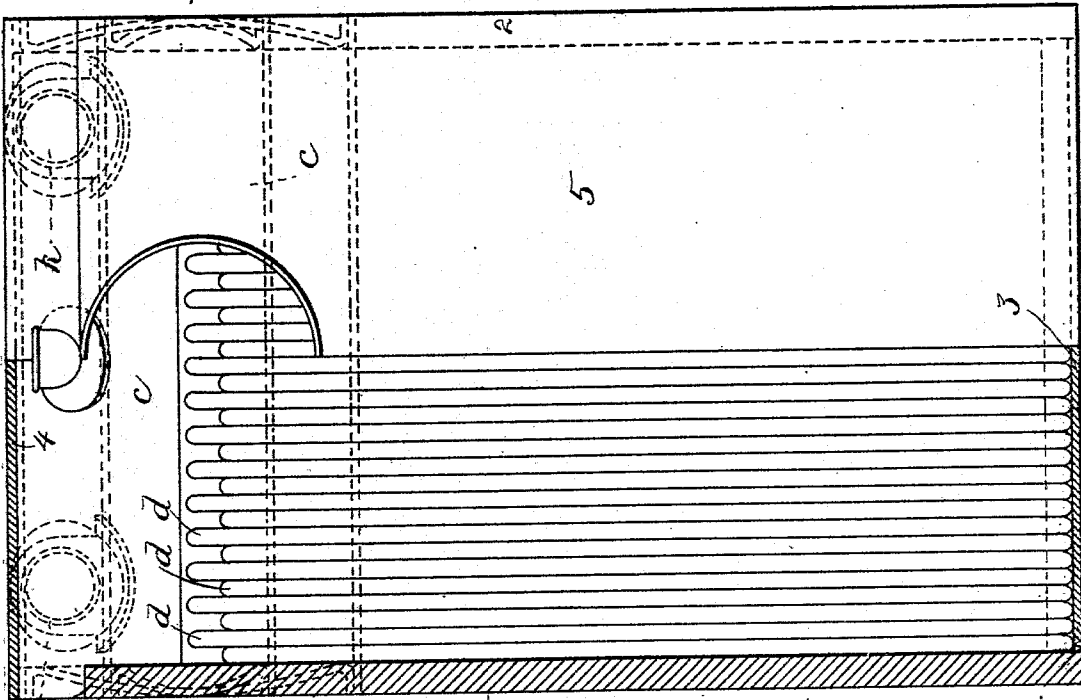
(No Model.)

2 Sheets—Sheet 1.

C. D. MOSHER.
STEAM BOILER OR GENERATOR.

No. 515,784.

Patented Mar. 6, 1894.



WITNESSES:

H. A. Hall.
A. D. Hanson.

FIG. 1.

INVENTOR:

C. D. Mosher
by Wright Brown & Conley
Atty.

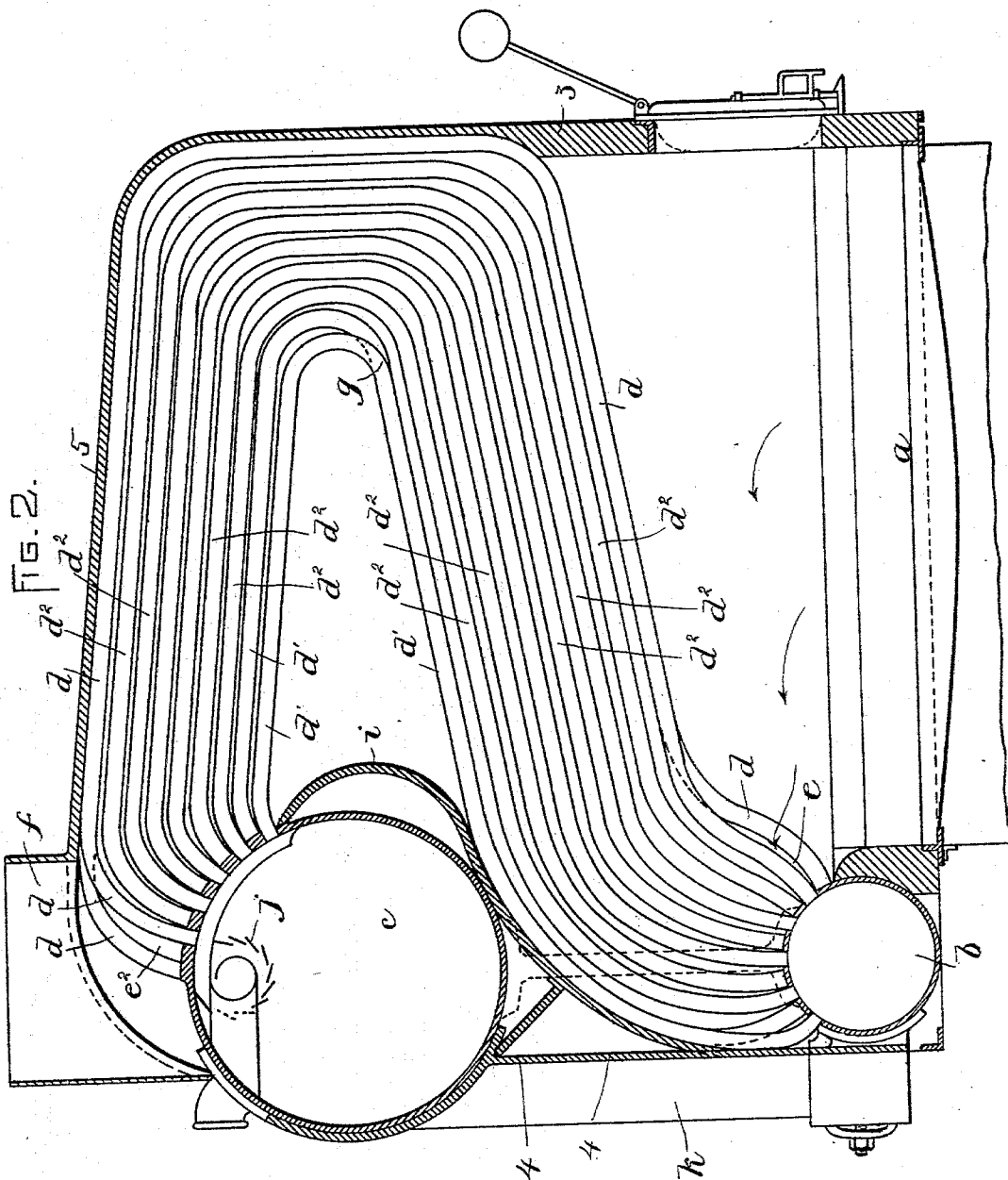
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H. A. Hall.
A. D. Harrison.

INVENTOR:

C. D. Mosher
by Knight Brown Crowley
Attys.

UNITED STATES PATENT OFFICE.

CHARLES D. MOSHER, OF NEW YORK, N. Y.

STEAM BOILER OR GENERATOR.

SPECIFICATION forming part of Letters Patent No. 515,784, dated March 6, 1894.

Application filed January 7, 1893. Serial No. 457,604. (No model.)

To all whom it may concern:

Be it known that I, CHARLES D. MOSHER, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Steam Boilers or Generators, of which the following is a specification.

This invention relates to that class of boilers or steam generators in which the water drum or receptacle located at or near the level of the grate is connected by a plurality of tubes with a steam drum or receptacle located at a higher point, the said tubes being arranged so that their contents will be subjected to the heat of the fire, as shown in Letters Patent of the United States, No. 432,760, granted to me July 2, 1890. In the generator shown in said patent, two water drums and two steam drums are employed, the drums extending lengthwise of the furnace.

My present invention has for its object to provide a generator of the class above indicated, of more compact, and less expensive construction, than heretofore, and to this end the invention consists in the improvement which I will now proceed to describe and claim.

Of the accompanying drawings forming a part of this specification—Figure 1, represents a front elevation of my improved steam generator, a part of the casing thereof being shown in section. Fig. 2, represents a longitudinal section on line 2 2, Fig. 1. Fig. 3, represents a plan view, a part of the casing being shown in section.

The same letters and numerals of reference indicate the same parts in all the figures.

In the drawings, *a* represents the grate of the fire box or furnace, the same being the bottom of a casing which consists of the side walls 2 2, the front wall 3, the rear wall 4, and the top 5.

b represents the water drum which extends across the fire box between the rear wall 4, and the adjacent end of the grate, the lower side of said drum being at about the level of the top of the grate.

c represents the steam drum which is located directly above the water drum, both the steam drum and the water drum being arranged substantially at right angles with

the direction of the length of the fire box. The upper portion of the water drum is connected with the upper portion of the steam drum by a plurality or group of tubes *d d'*. Each of said tubes is bent to form a loop, which is disposed in a vertical plane, and extends lengthwise of the fire box, or from the rear wall 4 toward the front wall 3. The tubes *d* forming one side of the group, are arranged so that collectively they form a close wall extending from a point near the water drum to a point near the steam drum, said tubes being separated at their lower ends to form openings *e* for the admission of products of combustion from the fire box to the spaces surrounding the intermediate tubes, *d'*, and at their upper ends to form openings *e'* for the escape of products of combustion to the stack *f*. The tubes *d'* forming the opposite side of the group are arranged to form a close wall extending from their lower ends to the point *g*, where the tubes are bent to form the upper portion of the loops, the tubes *d'* being separated from said point to their junction with the steam drum, so that openings are formed for the escape of soot into the space or chamber between the sides or arms of the loops. It will be seen that the portions of the tubes *d'* that form a close wall of tubes, cause the products of combustion in their upward course to follow the bend of the pipes, said wall also serving as a means for preventing deleterious action of the hot gases upon the steam drum in case the latter should accidentally become empty. The arrangement of the tubes *d* in a close wall extending the greater portion of the length of the fire box, causes the products of combustion to pass to one end of the fire box, as indicated by the arrows in Fig. 2, before entering the space or flue between the tubes *d* and *d'*.

As an additional protection to the steam drum, I provide a plate or partition *i*, which may be of asbestos or other suitable non-conducting material, said partition being a continuance of the rear wall 4 of the fire box.

The steam drum is provided with a steam separator *j*, which separates the entrained water from the steam which enters the steam drum through the tubes, said separator be-

ing described in an application filed by me concurrently herewith so that I will not herein describe its construction.

k k represent return pipes, through which water passes from the lower portion of the steam drum to the water drum.

I do not in this application claim the combination of a furnace or fire box, a water drum located at one end of the same, and extending crosswise of the fire box, a steam drum substantially parallel with the water drum and located at a higher point, and a plurality or group of curved pipes connecting the upper portion of the water drum with the upper portion of the steam drum, and bent to form loops which are disposed in substantially vertical planes extending lengthwise of the fire box, said combination being claimed in my other application above referred to. It will be seen that the arrangement of the steam drum directly over the water drum reduces the length of the return pipes *k k* to the minimum, and therefore reduces the expense as compared with boilers in which the steam drum is not directly over the water drum. Said arrangement also makes the boiler more compact, because the return pipes are wholly within the width of the space occupied by the series of tubes, as shown in Figs. 1 and 2.

I claim—

In a boiler or steam generator, the combination of a furnace or fire box, a water drum extending across the rear end of the fire box, a steam drum extending across the rear end of the fire box directly over the water drum, vertical return pipes connecting said drums, and a group of tubes connecting the upper

portion of the water drum with the upper portion of the steam drum and bent to form loops disposed in vertical planes and extending lengthwise of the fire box, the tubes being bent to form inclined lower portions extending from the water drum toward the front of the fire box, and substantially horizontal or slightly inclined upper portions extending toward and joining the steam drum, the tubes forming one side of the group being arranged to form a wall having openings *e* at its lower end and openings *e*² at its upper end for the passage of the products of combustion, said wall extending continuously from the openings *e* to the front of the fire box and from thence back to a point over the steam drum where the openings *e*² occur, while the tubes forming the opposite side of the group are arranged for a portion of their length to form a wall extending from the water drum toward the front of the fire box and are open or separated from each other along the portions extending from the front of the fire box toward the steam drum to permit the escape of soot and ashes from between the tubes comprising the upper portions of the loops into the space between the parts or members of the loops, whereby cleaning is facilitated, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 27th day of December, A. D. 1892.

CHARLES D. MOSHER.

Witnesses:

C. F. BROWN,
A. D. HARRISON.