

(No Model.)

3 Sheets—Sheet 1.

F. PRINTZ.
WATER TUBE BOILER.

No. 547,286.

Patented Oct. 1, 1895.

Fig. 1.

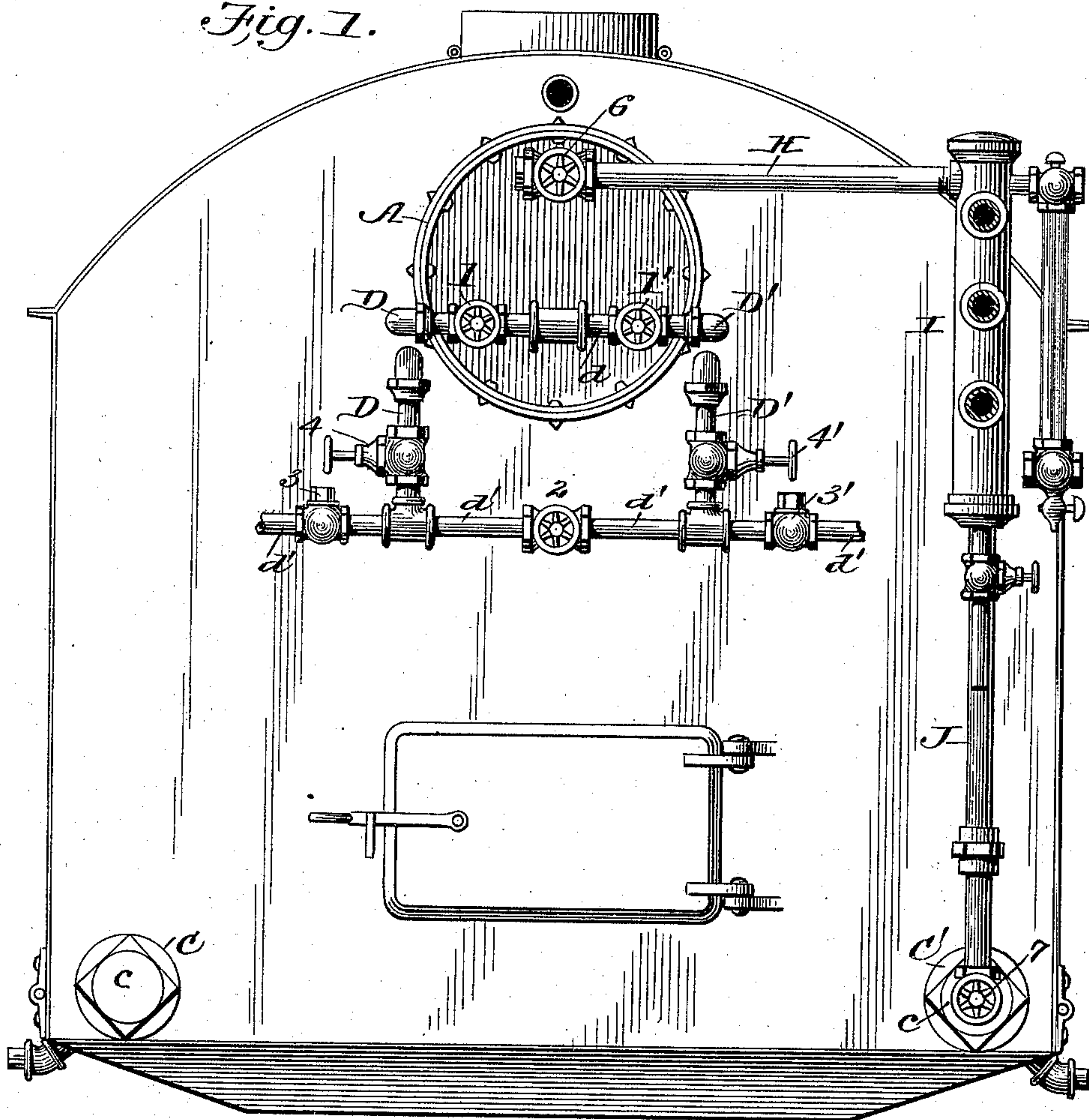
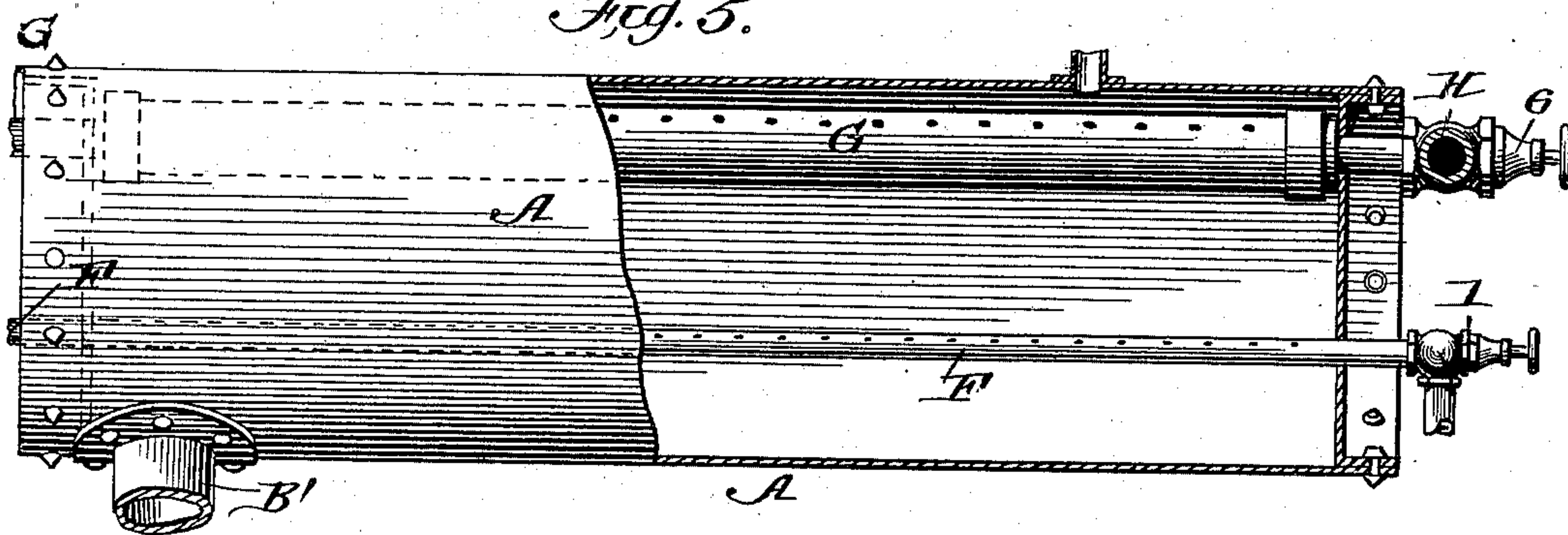


Fig. 5.



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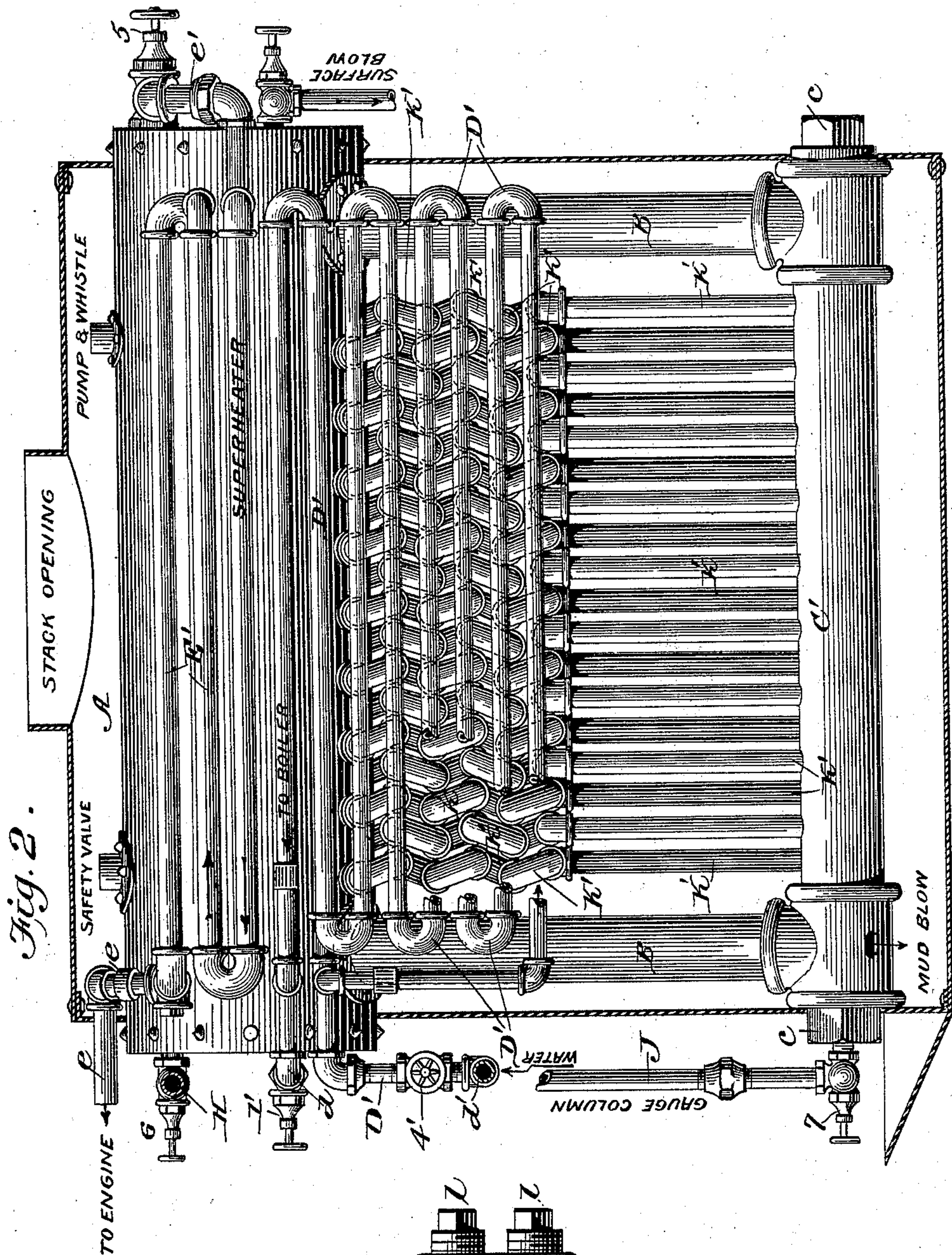
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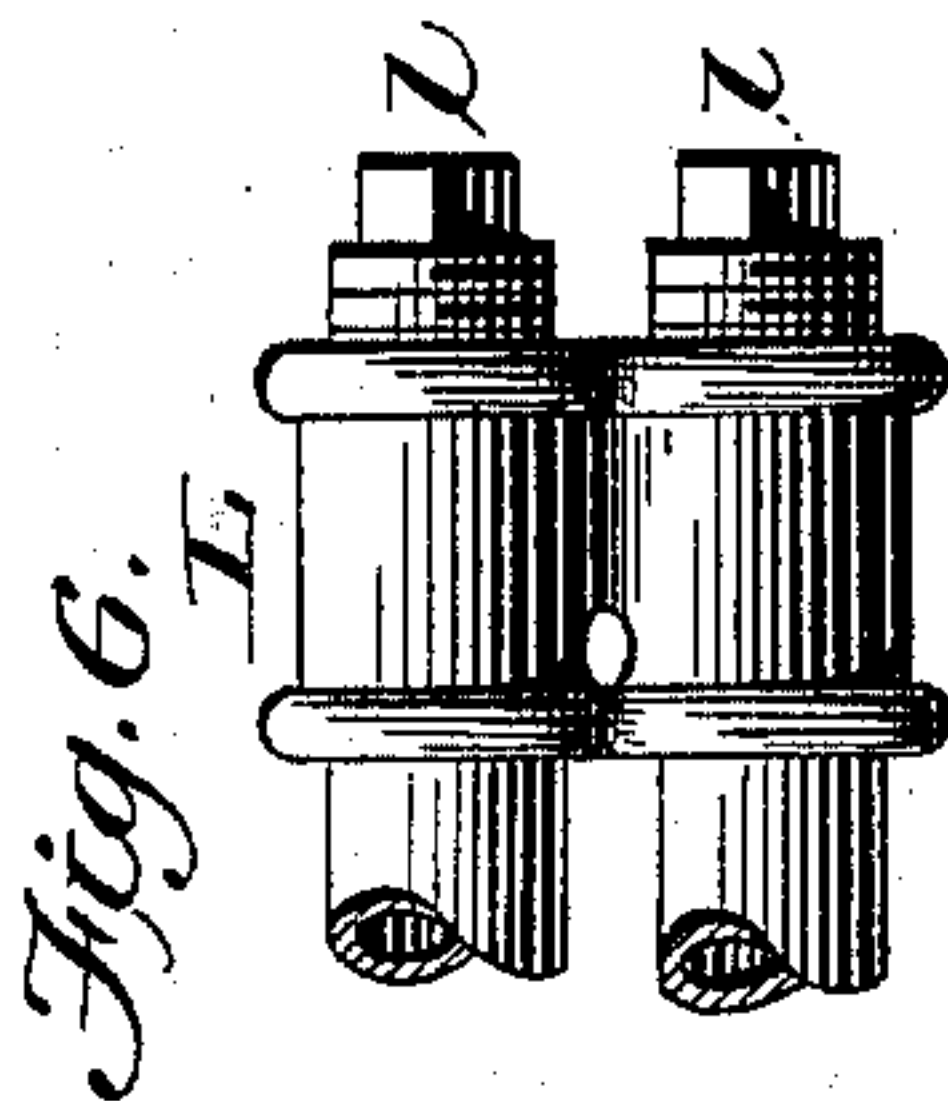
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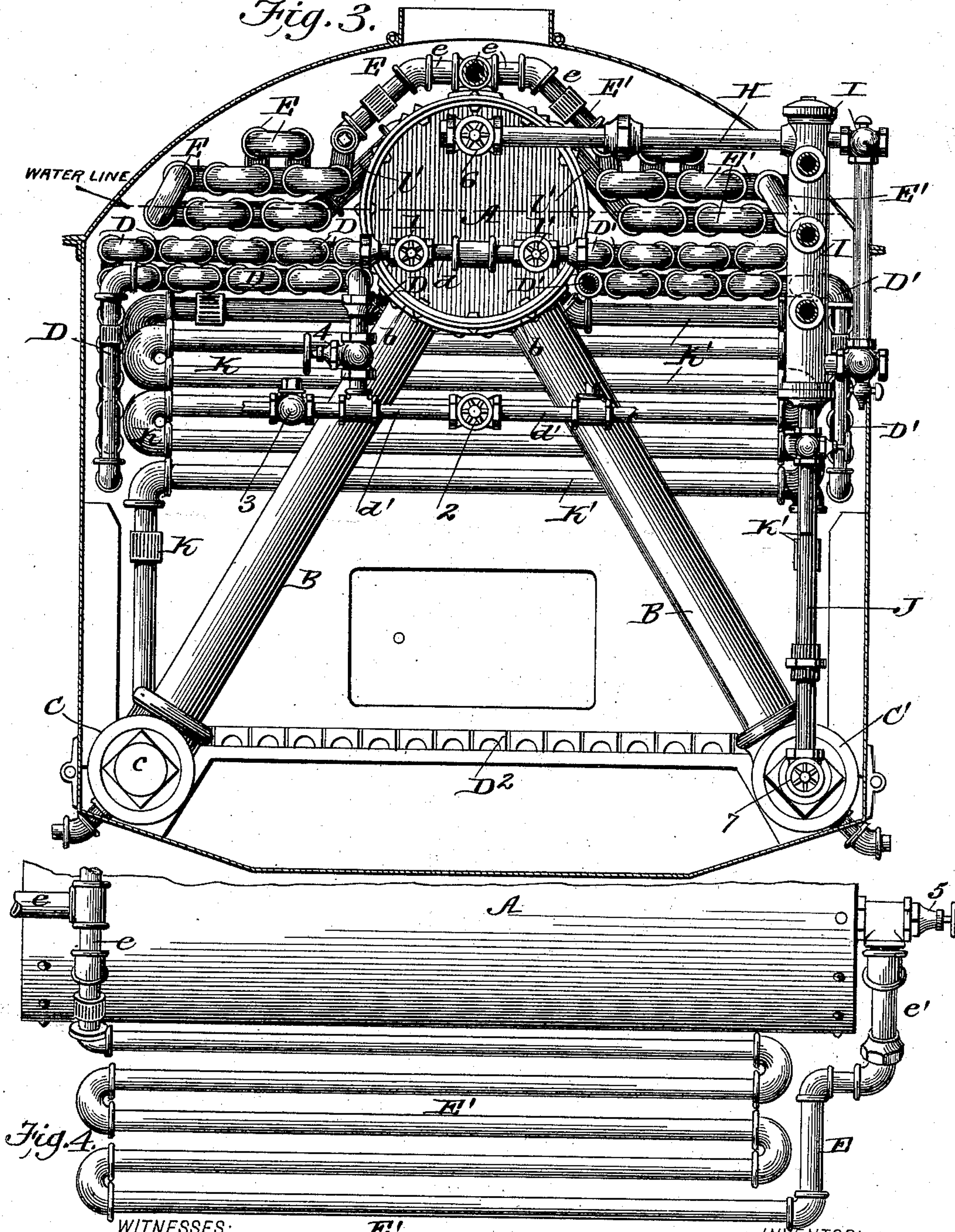
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Fig. 3.



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UNITED STATES PATENT OFFICE.

FRANK PRINTZ, OF NEW ORLEANS, LOUISIANA.

WATER-TUBE BOILER.

SPECIFICATION forming part of Letters Patent No. 547,286, dated October 1, 1895.

Application filed May 17, 1895. Serial No. 549,682. (No model.)

To all whom it may concern:

Be it known that I, FRANK PRINTZ, of New Orleans, in the parish of Orleans and State of Louisiana, have invented a new and Improved Steam-Generator, of which the following is a specification.

My invention is an improvement in that class of steam-generators having a steam drum or boiler proper supported upon water-legs which connect it with mud-drums, and having water-feeding, circulating, and steam-superheating coils connected with it in a suitable manner.

My improvement relates to a duplicate construction, arrangement, and combination of pipe-coils having certain valve attachments, as hereinafter described, whereby provision is made for isolation of a portion of the apparatus, while its duplicate is left intact for the purpose of facilitating repair, &c.

In the accompanying drawings, Figure 1 is a front view of the generator. Fig. 2 is a side view. Fig. 3 is an end view of the generator proper, the casing being in section. Fig. 4 is a plan view of a portion of the generator, showing the superheating-coil diagrammatically. Fig. 5, Sheet 1, is a broken side view of the boiler proper. Fig. 6, Sheet 2, is a detail view of an improved form of union or pipe coupling.

The main portion of the generator proper is inclosed by a metal casing having a hinged top and sides to facilitate access to the generator for the purposes of examination, repair, &c. The casing is in practice lined with asbestos and fire-tile up to the height of the fire-box.

The horizontal boiler or steam-drum A is supported by two pairs of water-legs B B', which are set at an angle of, say, forty degrees to each other and rest on and connect with two horizontal parallel mud-drums C C', having screw-plugs c. The grate D² is arranged between the drums. The upper ends of the water-legs B are provided with lateral arc-shape flanges b, that conform to the curve of the boiler A and are riveted to it. The heads of the boiler are also constructed with peripheral flanges and set into and riveted to the body of the boiler, as shown. There are two duplicate sets or coils of feed-water heating-pipes D and D', the set or coil D be-

ing arranged on the left side of the boiler A and the other coil D' on the right side. Each coil is composed of two sets of horizontal bends or convolutions and a third and vertical convolution extending down parallel to the adjacent side of the casing.

The ends of the two coils D D' are connected, Figs. 1 and 3, at the front of the boiler by means of horizontal pipes d and d'. The upper connecting-pipe d has two globe-valves 1 and 1', and the lower pipe d' has a globe-valve 2 and two check-valves 3 3'. There are also two other globe-valves 4 4', applied to the ends of the coils D D' contiguous to the lower connecting-pipe d'. At the points where the valves 1 and 1' are located in the upper pipe d the latter is connected with two parallel perforated pipes F, Fig. 5, which are arranged in the lower portion of the boiler A and extend through the ends of the same. Water may be admitted through either end of pipe d', and the globe-valves 1, 1', 2, and 4 being open it will pass through both coils D D' simultaneously, and becoming thus heated and partly converted into steam finally discharges from pipes F into the boiler A. The said pipes F distribute it the whole length of the latter, instead of at one point, as usual in this class of generators. It is apparent that if one of the coils D D' be defective or not required, it, say D, may be cut out by closing the central globe-valve 2 and the valves 1 and 4 belonging to it. Thus either coil D or D' may be cut out or one of them used alone, as necessity may dictate, by this simple manipulation of the globe-valves. There are two duplicate steam-superheating coils E E', arranged in horizontal convolutions on opposite sides of the boiler A and above the coils of feed-water pipes D D', as shown best in Fig. 3. These coils E E' are joined at the front end of the boiler, Figs. 2, 3, and 4, by a common pipe e, leading off to the engine, (not shown,) and the other ends of the coils E E' are connected by pipes e', Fig. 2, which are joined by a T union, having a globe-valve 5. With said union there is also connected a perforated tube G, Fig. 5, which is arranged in the steam-space of the boiler A. By closing said valve 5 access of steam to both superheating-coils E E' may be shut off and either coil then removed or plugged off,

after which the valve 5 being again opened use of the other coil may be continued. In this manner repairs may be easily effected without long delay in use of the boiler. To the front end of the perforated pipe G, Figs. 1 and 2, is attached a pipe H, leading to the water and steam gage I, from which a pipe J leads down to the plug of the mud-drum C'. By means of globe-valves 6 and 7, located, respectively, at the outer and lower ends of the pipes H and J, the gage I may be cut off from connection with the generator proper, as occasion may require.

The circulating-coils K K', which connect the boiler A with the mud-drums C C', are distinguished by one peculiarity of construction and arrangement—that is, there are several transverse convolutions or sub-coils, (see Fig. 2,) and the pipes of one convolution or sub-coil are arranged opposite a space between those in the convolutions above or below it. In other words, the arrangement is what may be termed "staggered" or "zigzag." It is apparent that by this arrangement the flame and heated products of combustion impinge on each pipe of each sub-coil, and more surface is exposed than if the pipes were in the same vertical plane.

I make provision by means of removable screw-plugs at various points for removal of scale and other deposits on the interior of the coils; but my special improvement in this relation is shown in Fig. 6, it being a double coupling L for two pipes. It consists of two straight and parallel tubes, threaded interiorly and formed integrally. Screw-plugs are inserted in the outer ends of the coupling. By this arrangement it is obvious access may be readily had to the interior of the pipes which the coupling connects for the purpose of removing scale or other form of deposit.

What I claim is—

1. In a steam generator, the combination, with the boiler proper, of the two duplicate feed-water coils D, D', arranged oppositely, and having globe valves 4 and 4', the transverse pipes *d*, *d'*, which connect the ends of said coils at the end of the boiler, and the

globe valves 1, 1', and 2, applied to said pipes, as shown and described for the purpose specified.

2. In a steam generator, the combination, with the boiler proper, of the feed-water coils, having end connecting pipes *d*, *d'*, globe valves arranged as specified, and the perforated pipes, F, arranged in the lower portion of said boiler and connecting with the aforesaid transverse pipes, as shown and described.

3. In a steam generator, the combination, with the boiler proper, of the duplicate and opposite steam-superheating pipes, E and E', the latter (E) having the globe valve, 5, arranged at their junction with the boiler pipe, all as shown and described.

4. In a steam generator, the combination, with the boiler proper, of the duplicate and opposite steam-superheating coils E, E', their duplicate end connecting pipes, *e* and *e'*, a perforated pipe, G, arranged in the steam space of the boiler and connecting at one end with the pipe, *e'*, and the globe valve, 5, located at the junction of said pipes *e*, *e'*, and G, as shown and described for the purpose specified.

5. The improved steam generator, composed of the steam boiler proper, the duplicate and opposite feed-water coils D, D', transverse pipes, and globe valves 1, 1', 4, 4', and 2 arranged as specified, the duplicate superheating coils E, E', having end connecting pipes *e*, *e'*, the perforated pipe, G, within the boiler, and the globe valve, 5, arranged as shown and described for the purpose specified.

6. The improved steam generator, composed of the boiler proper, mud-drums and water legs, the circulating coils, K, K', the duplicate feed-water coils, D, D', and their connecting pipes *d*, *d'*, the superheating coils, E, E', and their connecting pipes *e*, *e'*, the perforated pipes, F and G, arranged in the boiler, and globe valves applied as shown, whereby one of either coil may be isolated as specified.

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Witnesses:

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