

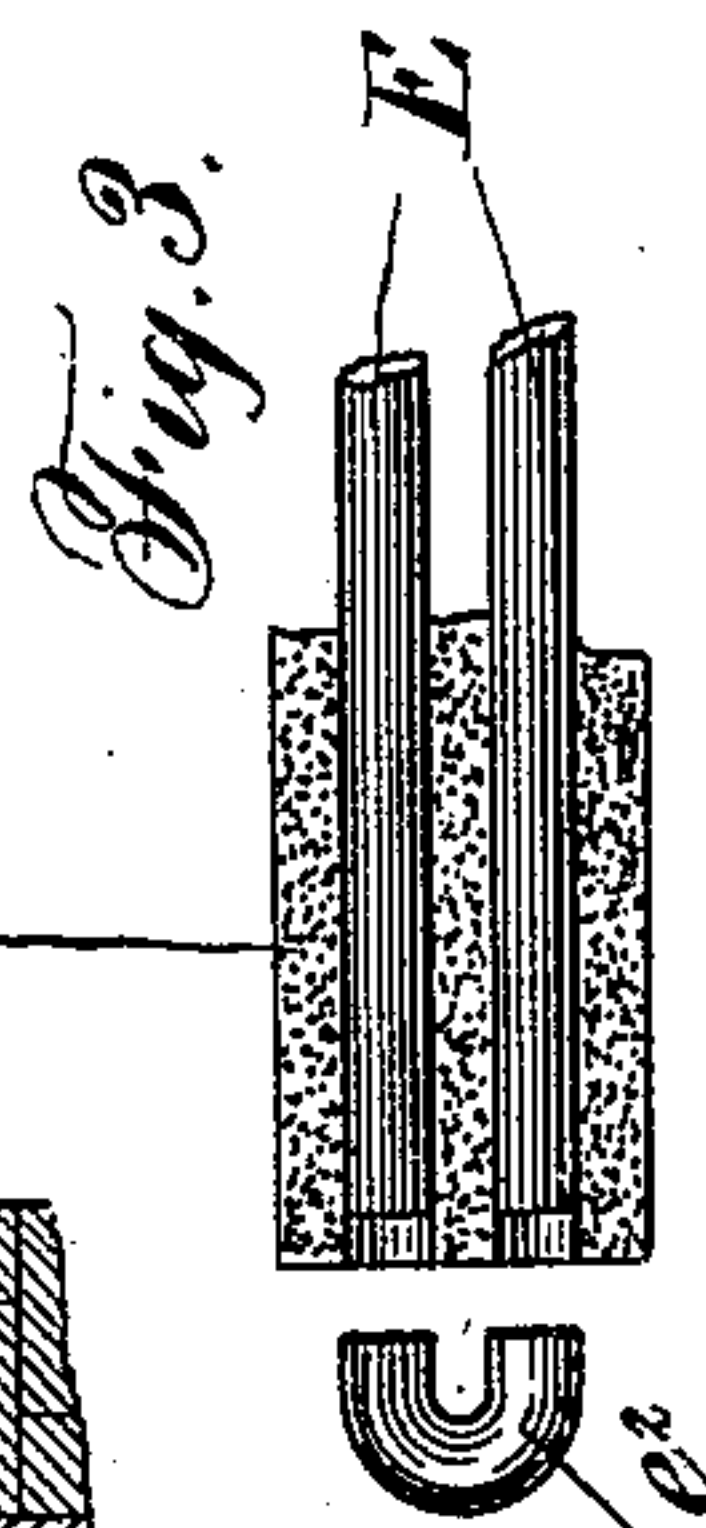
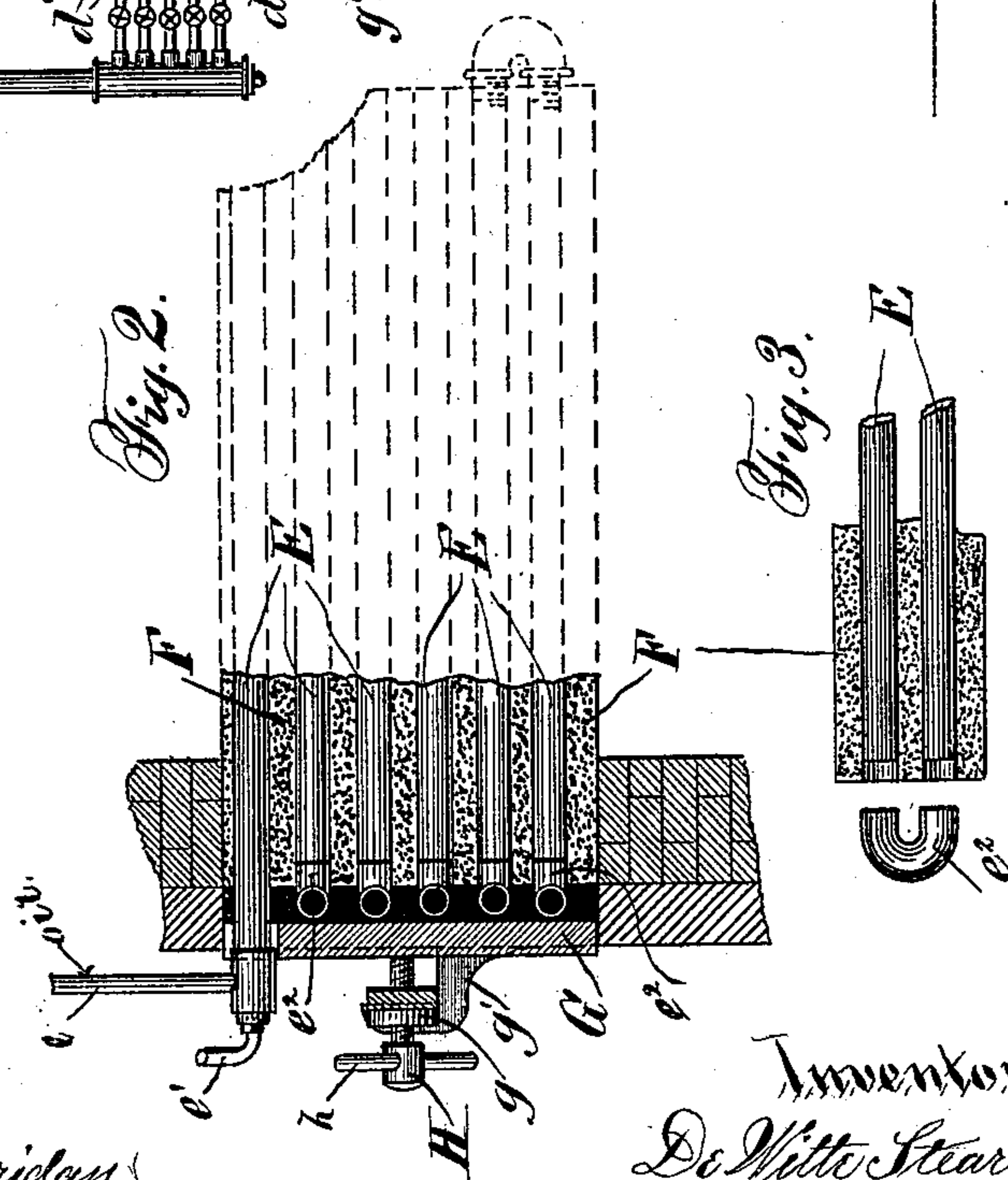
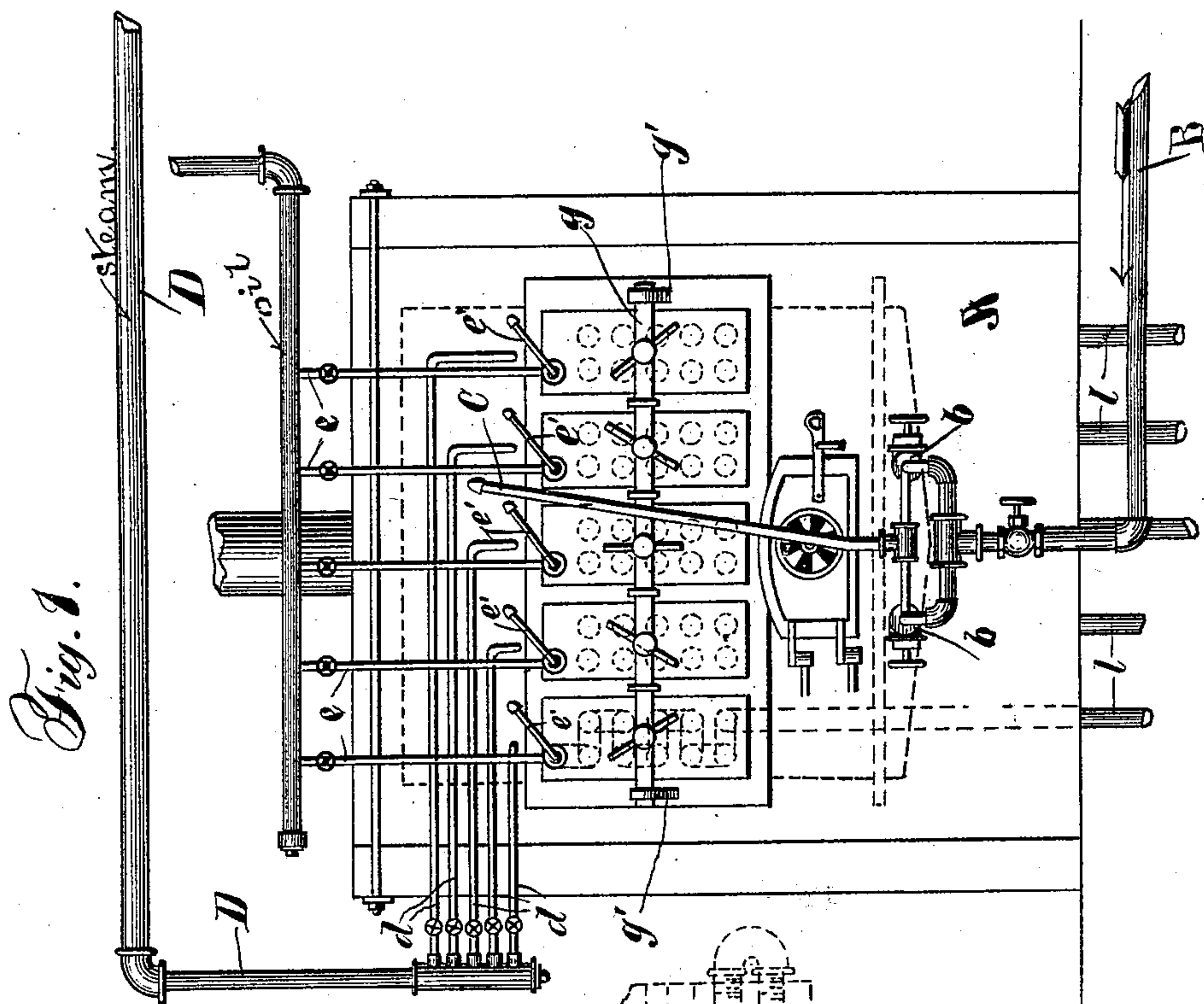
(No Model.)

2 Sheets—Sheet 1.

DE WITTE STEARNS.
GAS GENERATOR.

No. 518,202.

Patented Apr. 10, 1894.



Witnesses.
Thos. F. Sheridan
Samuel C. Hibben

Inventor.
De Witte Stearns.
By Banning & Banning & Payson.
Attorneys

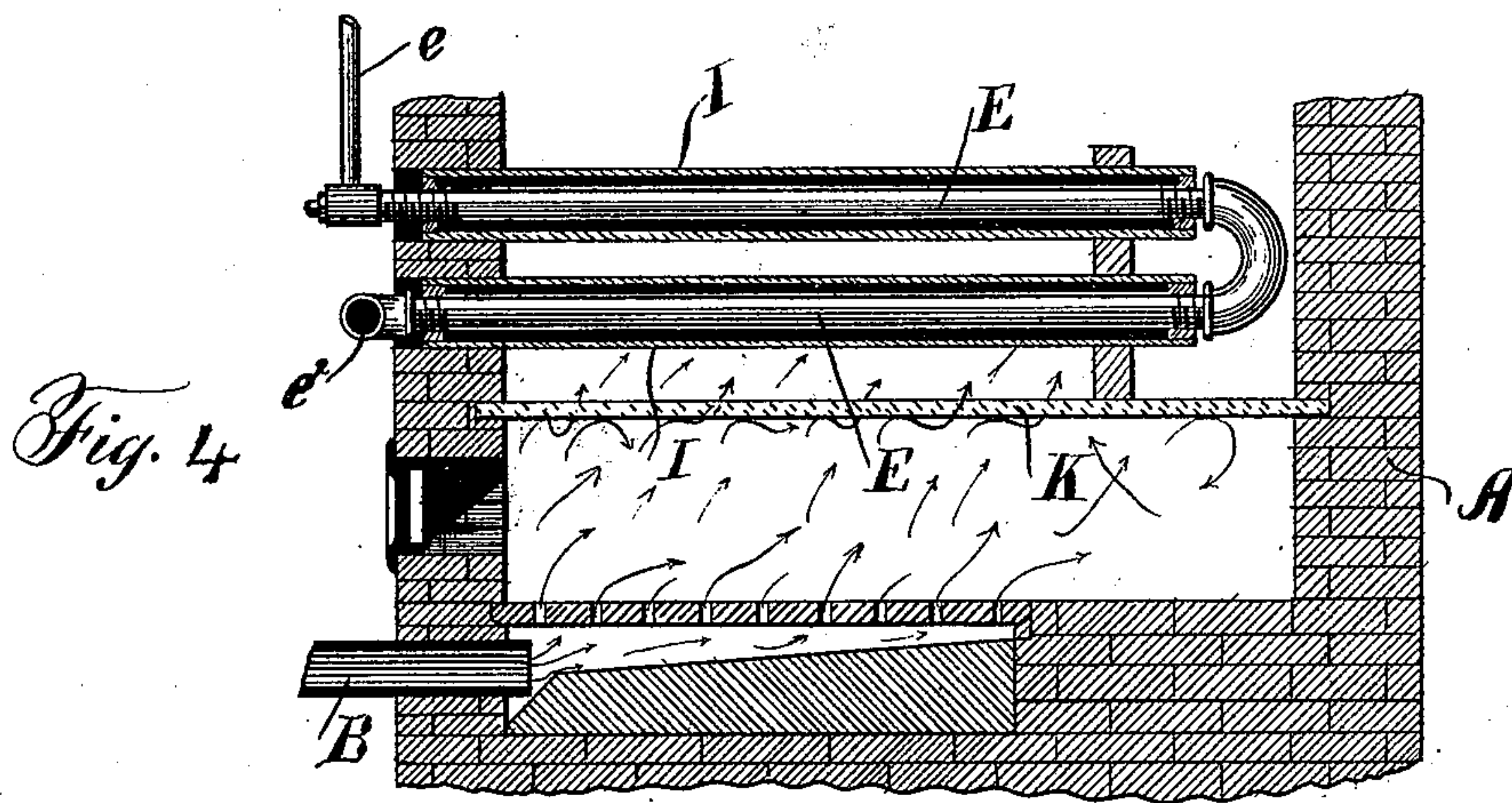
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UNITED STATES PATENT OFFICE.

DE WITTE STEARNS, OF CHICAGO, ILLINOIS.

GAS-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 518,202, dated April 10, 1894.

Application filed January 11, 1893. Serial No. 458,003. (No model.)

To all whom it may concern:

Be it known that I, DE WITTE STEARNS, of Chicago, Illinois, have invented certain new and useful Improvements in Gas-Generators, of which the following is a specification.

This invention relates particularly to improvements in gas generators, and it is intended specially to be an improvement upon the gas generator shown and described in the Letters Patent granted to me October 29, 1889, No. 413,767; and it consists in the features, details and combinations hereinafter described and claimed.

In the drawings, Figure 1 is a front elevation showing one method of embracing my improvements; Fig. 2, a side elevation of a portion of the retort and jacket surrounding the same; Fig. 3, a plan with a portion of one retort, showing the method of securing the cap, and Fig. 4, a modification of my improved retorts and jackets.

In the gas generators now in use, the retorts extending into the combustion chamber are in direct contact with the flames and products of combustion, so that during the process of generating gas they are subjected to this intense heat, as well as the elements of combustion, and are burned and wasted away, making it necessary to quite frequently replace the retorts, which means considerable loss of time, as well as great expense. To overcome these objections, as well as to economize a larger per cent. of the heat used in the combustion chamber, is the design of my invention.

In general, the method of using the gas generator shown in Fig. 1 is about the same as described in the Letters Patent hereinbefore referred to, and consequently I will not enter into any detailed description of my process of generating gas.

In constructing my improvements I use a furnace, A, of any general form of construction.

B is the gas inlet pipe, leading from the holder to the burner.

b are air valves furnishing the requisite supply of air to the burner.

C is the pipe for furnishing the superheated steam which enters into combustion with the gas. D, a steam pipe leading from the boiler

or source of steam supply, having branch pipes, d, which enter the combustion chamber of the furnace to superheat the steam. E, the retorts, and F the jacket, preferably made of fire clay surrounding the same. These retort tubes are joined together at the back, in series, by means of return bends. The initial tube of the retort is connected at its front end directly, by means of the pipe e, with the source of oil supply or other liquid hydrocarbon, and by means of the pipe e', with the pipes containing the superheated steam. To connect the pipes composing the retort in the front end of the furnace with each other, in series, I use preferably a return bend, e², which enters the opening in the retort jackets a short distance, in order to guide the same against the end of the pipe, and to press these return bends, which I will for convenience term "caps," firmly against the ends of the retort pipe, I use a cover, G, which is slightly larger than the end of the retort jacket, and which is held firmly against the caps by means of a bar g, in turn supported by the lugs, g', Extending through this bar, preferably near the center of the covers, are screws, H, having handles, h, so that the turning of this screw in either direction will serve to firmly clamp the cover in place, or allow it to be taken therefrom for the purpose of cleaning the retort or inserting a new one.

In making the refractory jacket, I prefer to first mold it, leaving the longitudinal chambers extending clear through, and afterward bake it, then inserting the tubes in series which form the retorts. This method of making the jacket will be the simplest and most economical, as well as allowing of new tubes to be inserted in the jacket or taken therefrom, when either the tubes or the jacket might be destroyed.

In the foregoing description it will be seen that I have furnished my retorts with a jacket composed preferably of fire clay, which protects the same from the direct action of the flame and the products entering into combustion, and enables me to use a retort for a much greater length of time, as well as having the jacket act as a reservoir to absorb and retain in the combustion chamber a considerable percentage of the heat, which would other-

wise pass out and up into the atmosphere, as well as providing an easy method by which the individual tubes composing one bench or retort can be inspected or cleaned.

5 In Fig. 4, I have shown a modification of my improved retort and jacket, in which I use a retort, E, surrounded preferably by a metallic pipe, I, on that portion which enters the combustion chamber. Directly underneath this
10 retort is a baffle plate, K, against which the flames first strike and are deflected around each side, entering the combustion chamber above, so that these metallic jackets are not in direct contact with the force of the flame,
15 but only with the deflected heat and the elements of combustion, thereby minimizing to a great extent the injury which would otherwise result if the full force of the flame and heat were brought into direct contact with
20 them. In other respects, the manner of arranging the retorts and connecting them can be the same as hereinbefore described.

While I have entered into a more or less minute description of the details of my inventions and the forms with which I have embodied them, I do not desire to be understood
25 as limiting myself unduly to these specific forms, but that I contemplate changes in form and construction, the use of different materials, and equivalent members, as circumstances may warrant or necessity demand.
30

I claim—

1. In gas generators, the combination of a

retort consisting of a series of removable metallic tubes connected together alternately at
35 one end by return bends, a block of refractory material provided with longitudinal passages for the reception of the tubes forming the retorts and surrounding such tubes, return
40 bends adapted to join the opposite end of the tubes alternately together and to form one continuous channel, a cap for securely holding such return bends against the tubes and prevent leakage, and means for locking the
45 cap securely in place, substantially as described.

2. In gas generators, the combination of a retort consisting of a series of removable metallic tubes joined together alternately at one
50 end by return bends, a block of refractory material provided with longitudinal passages for the reception of the tubes forming the retort and surrounding such tubes, return bends adapted to detachably engage the other end
55 of the tubes alternately to form one continuous channel, means for guiding the return bends into complete engagement with such tubes, a cap adapted to hold such return bends in engagement with the tubes, and means for
60 securely locking such cap in position, substantially as described.

DE WITTE STEARNS.

Witnesses:

CHRIS. F. SHERIDAN,
SAMUEL E. HIBBEN.