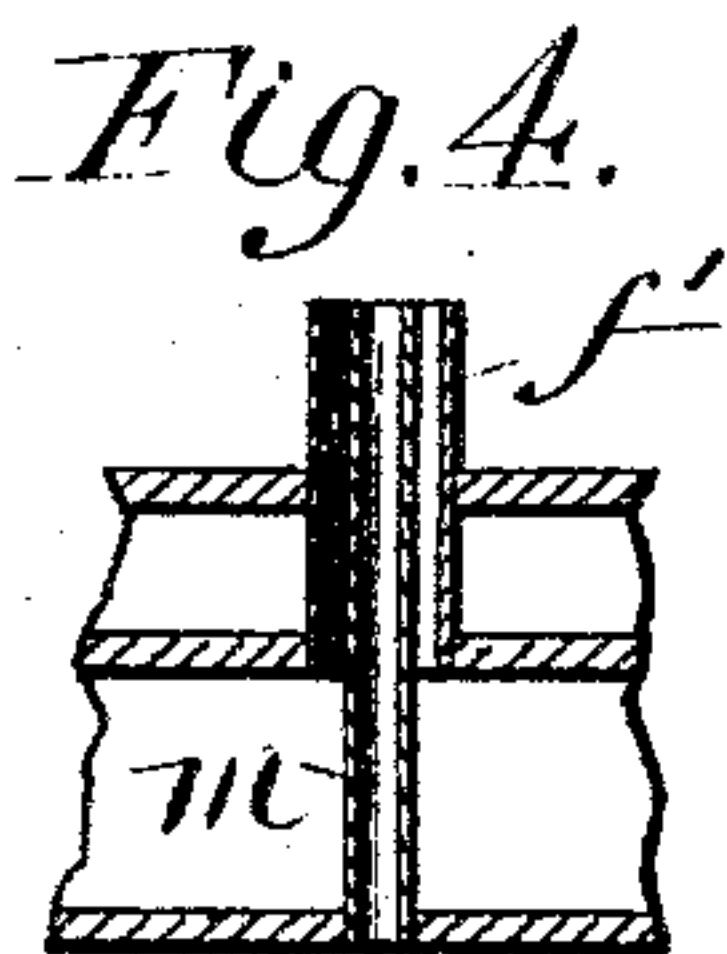
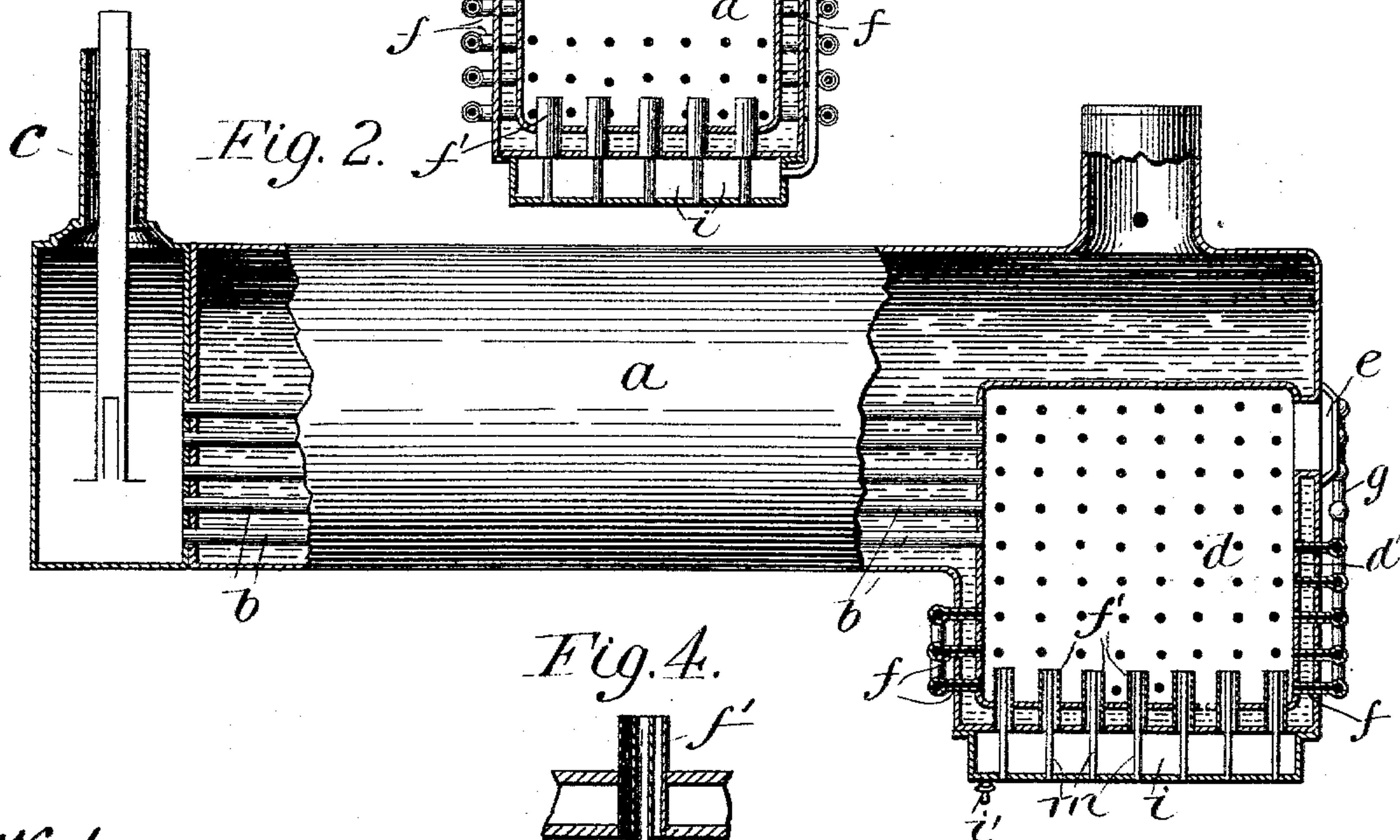
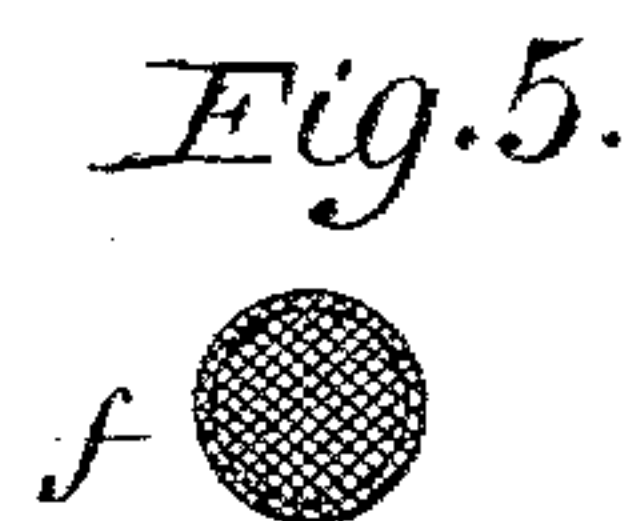
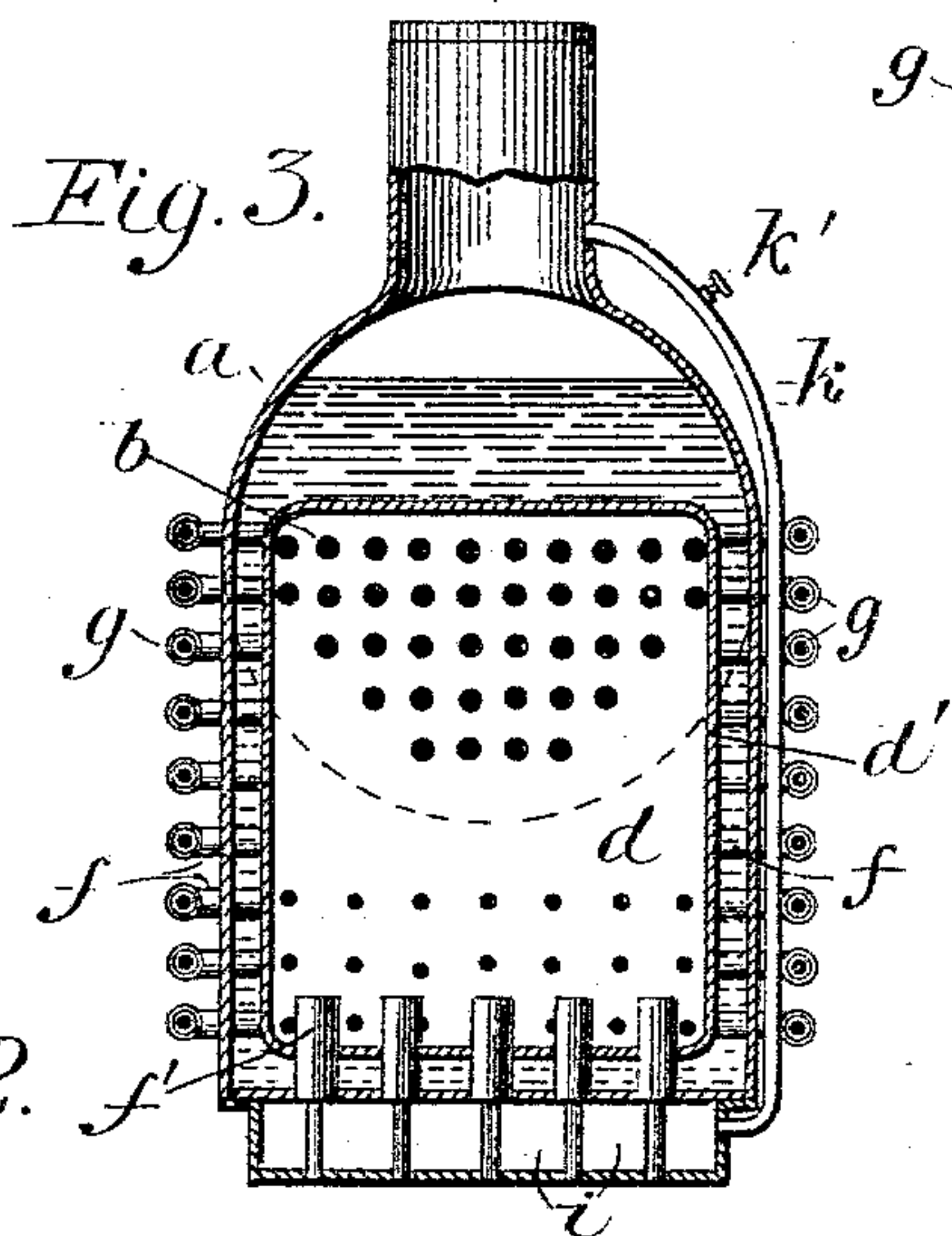
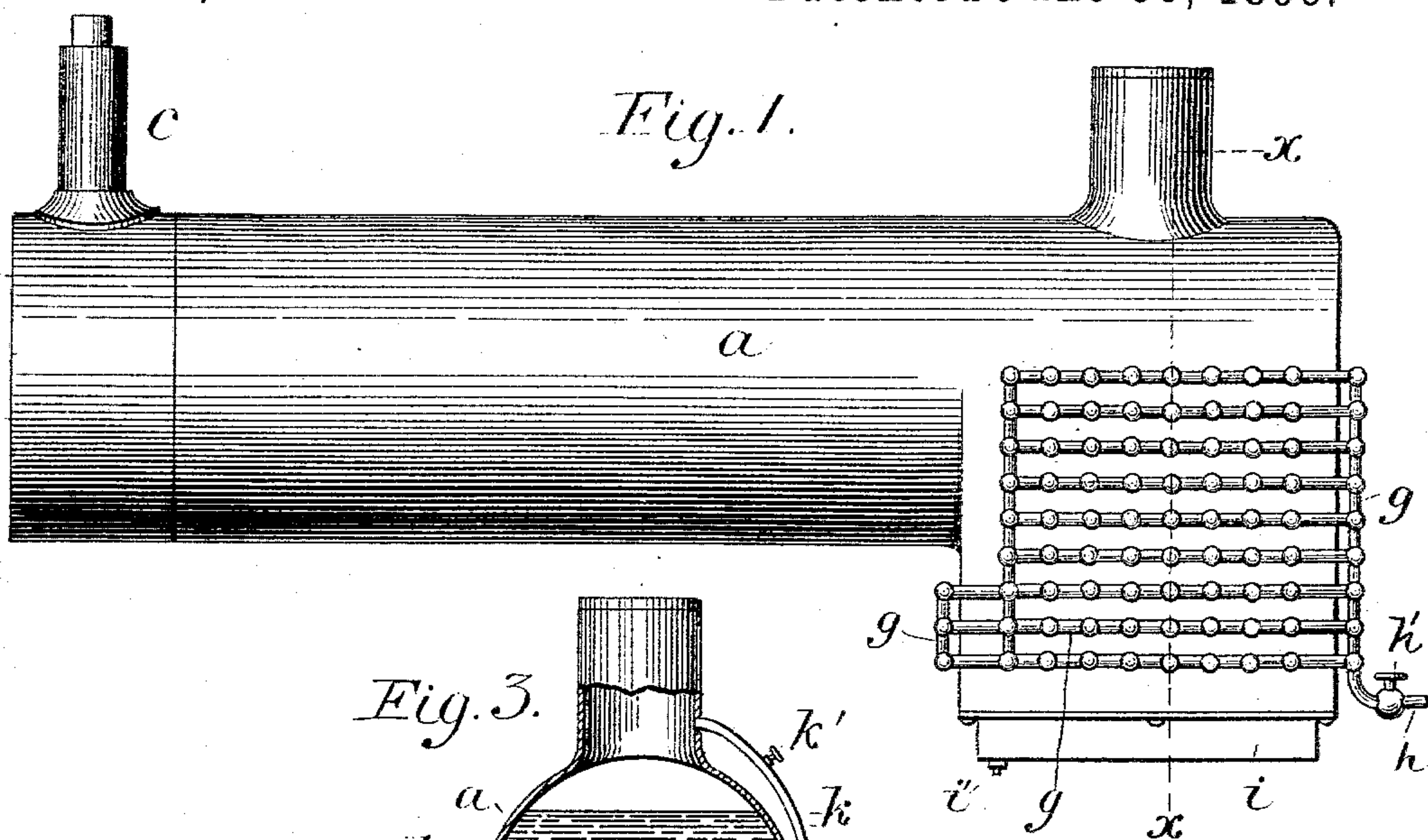


(No Model.)

W. T. CHAMBERLAIN.
PETROLEUM BURNING FURNACE.

No. 562,802.

Patented June 30, 1896.



Witnesses:
Guzo M. Luther
Frank A. Foster.

Inventor,
William T. Chamberlain
By his Attorney
Frank H. Allen.

UNITED STATES PATENT OFFICE.

WILLIAM T. CHAMBERLAIN, OF NORWICH, CONNECTICUT, ASSIGNOR OF
ONE-HALF TO CALVIN B. BEEBE, OF SAME PLACE.

PETROLEUM-BURNING FURNACE.

SPECIFICATION forming part of Letters Patent No. 562,802, dated June 30, 1896.

Application filed February 5, 1896. Serial No. 578,164. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM T. CHAMBERLAIN, a citizen of the United States, residing at Norwich, in the county of New London and State of Connecticut, have invented a certain new and useful Improvement in Petroleum-Burning Furnaces, which improvement is fully described and set forth in the following specification, reference being had to the accompanying sheet of drawings.

My invention has particular relation to the feeding and distribution of oil in petroleum-burning furnaces, my immediate purpose being to provide specially for the free mingling of oil, air, and steam as the said elements pass into the combustion-chamber.

In order to explain my invention clearly, I have provided the annexed sheet of drawings, in which—

Figure 1 is a side elevation of a locomotive-boiler embodying said invention, and Fig. 2 shows portions of the front and rear of such a boiler in central vertical section. Fig. 3 is a cross-sectional view on line X of Fig. 1, and Fig. 4 is an enlarged central sectional view of one of the air and steam pipes $m f'$ and their supports. In Fig. 5 I have illustrated (considerably enlarged) the inner or delivery end of one of the several hollow stay-bolts which I utilize as oil-pipes.

I have illustrated my invention here as applied to a locomotive-boiler, but it will be obvious that it is as well adapted for use with other forms of boilers.

In the annexed drawings the letter a indicates the shell of a tubular boiler; b , the tubes; c , the stack, and d the fire-box or combustion-chamber, said chamber being provided with a door e , through which the fire may be viewed when desired. The casing d' of the combustion-chamber is supported chiefly by a number of stay-bolts f , that are made hollow and extend outward beyond the boiler-shell a , and the outer ends of said hollow bolts are connected by pipes g , that are in turn connected with a main supply-pipe h , that leads from an oil-tank located at some convenient place, as, for example, on the locomotive-tender. The supply-pipe h is provided with a valve h' , by means of which the

flow of oil through said pipe may be regulated or cut off entirely.

Immediately beneath the combustion-chamber d is a chamber i , that is connected by a number of hollow stay-bolts f' with the said combustion-chamber, and leading from the steam-dome to said chamber i is a pipe k , by means of which superheated steam may be carried into said chamber to find its way thence through pipes f' into the combustion-chamber. Within and concentric with said pipes f' are smaller pipes m , that extend from the upper ends of pipes f' downward to and through the lower wall of the steam-chamber i , thus providing a number of passages through which air may pass freely into the combustion-chamber. It will now be seen that three distinct systems of pipes lead into the combustion-chamber, to wit, one system for oil, one for air, and one for jets of steam, and these to produce the best results should be arranged and regulated to discharge the said elements into the combustion-chamber in proper proportions to provide, when commingled, an inflammable gas. In order to prevent the too free discharge of oil through the pipes f , I preferably cover the inner ends of said pipes with wire-gauze of very fine mesh, which, as the oil is forced through the pipes g and f under low pressure, causes said oil both to spray into the chamber d and to run down the walls thereof in very thin sheets, and so long as the oil mingles with the steam which enters through pipes f' and is oxygenated by the air that rushes in through pipes m a fierce and constant heat is maintained in the said combustion-chamber, and this desirable result is reached without the aid of a stoker, as will be understood. Pipe k is provided with a valve k' , by means of which the supply and pressure of steam in chamber i may be regulated, and said chamber i is provided with a petcock i' , by means of which water (resulting from condensation or otherwise) in said chamber i may be drawn or blown out.

A proper degree of draft may be maintained in the combustion-chamber by any of the means in common use.

My described arrangement of oil, steam,

and air pipes provides a practical and economical means for mingling the several elements and makes it possible for the engine-driver to also control the fire, and with a system as herein set forth, whereby perfect combustion may be assured, an oil-burning furnace may be made more economical than a coal-burner.

Having described my invention, I claim as new and wish to secure by Letters Patent—

In combination with a boiler, a combustion-chamber, supported within said boiler

by hollow stay-bolts whose outer ends are connected with an oil-supply pipe, a steam-chamber, pipes connecting the steam and combustion chambers, and air-supply pipes leading through the said steam-pipes, as set forth and discharging at the delivery ends of the steam-pipes.

WILLIAM T. CHAMBERLAIN.

Witnesses:

FRANK H. ALLEN,

FRANK A. LESTER.