

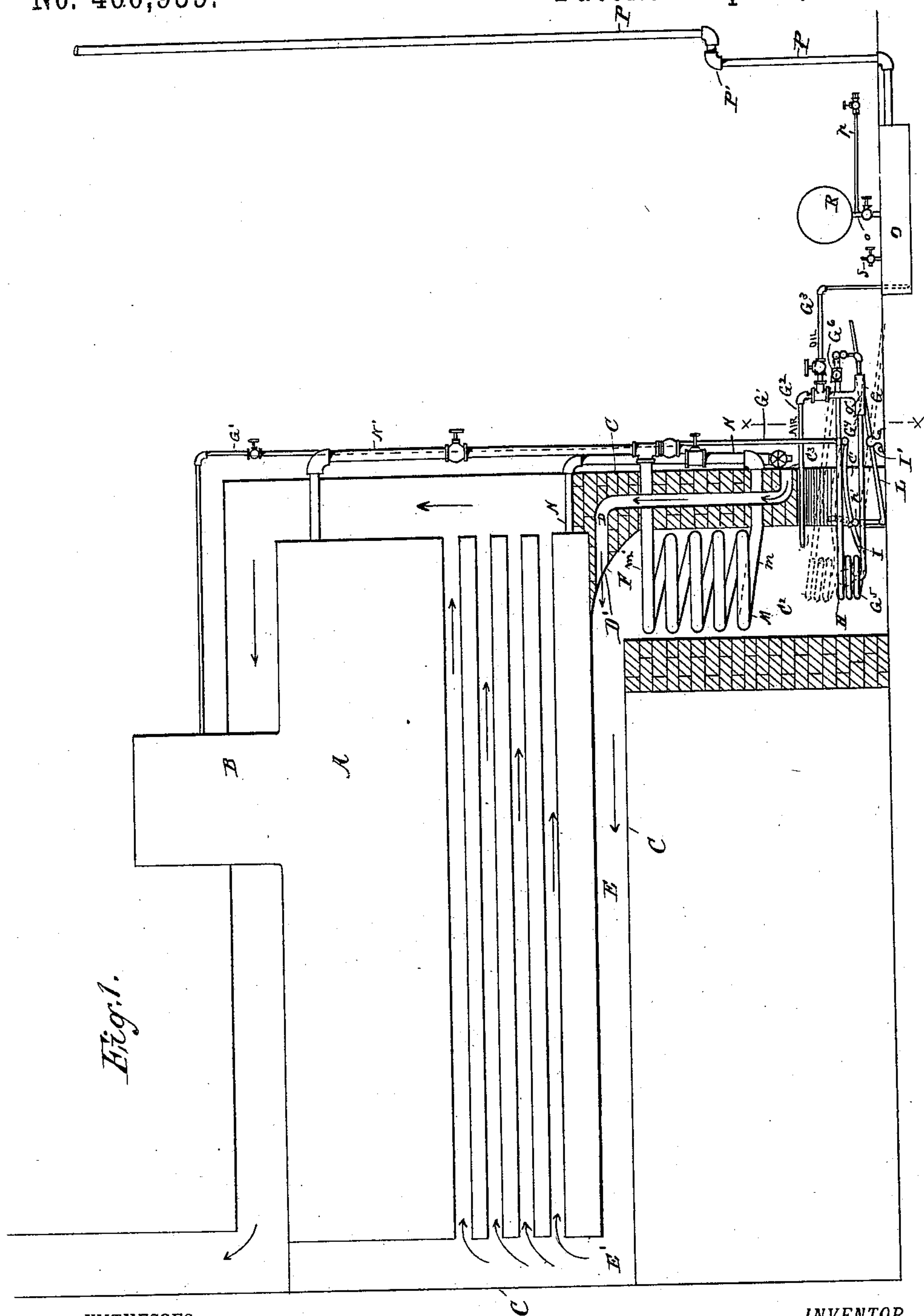
(No Model.)

2 Sheets—Sheet 1.

J. F. SEERY.
HYDROCARBON APPARATUS.

No. 400,959.

Patented Apr. 9, 1889.



WITNESSES:

Chas Benjamin
R. H. Boskerck

INVENTOR,
James F. Seery

BY

Grant & Coe

ATTORNEYS.

(No Model.)

2 Sheets—Sheet 2.

J. F. SEERY.
HYDROCARBON APPARATUS.

No. 400,959.

Patented Apr. 9, 1889.

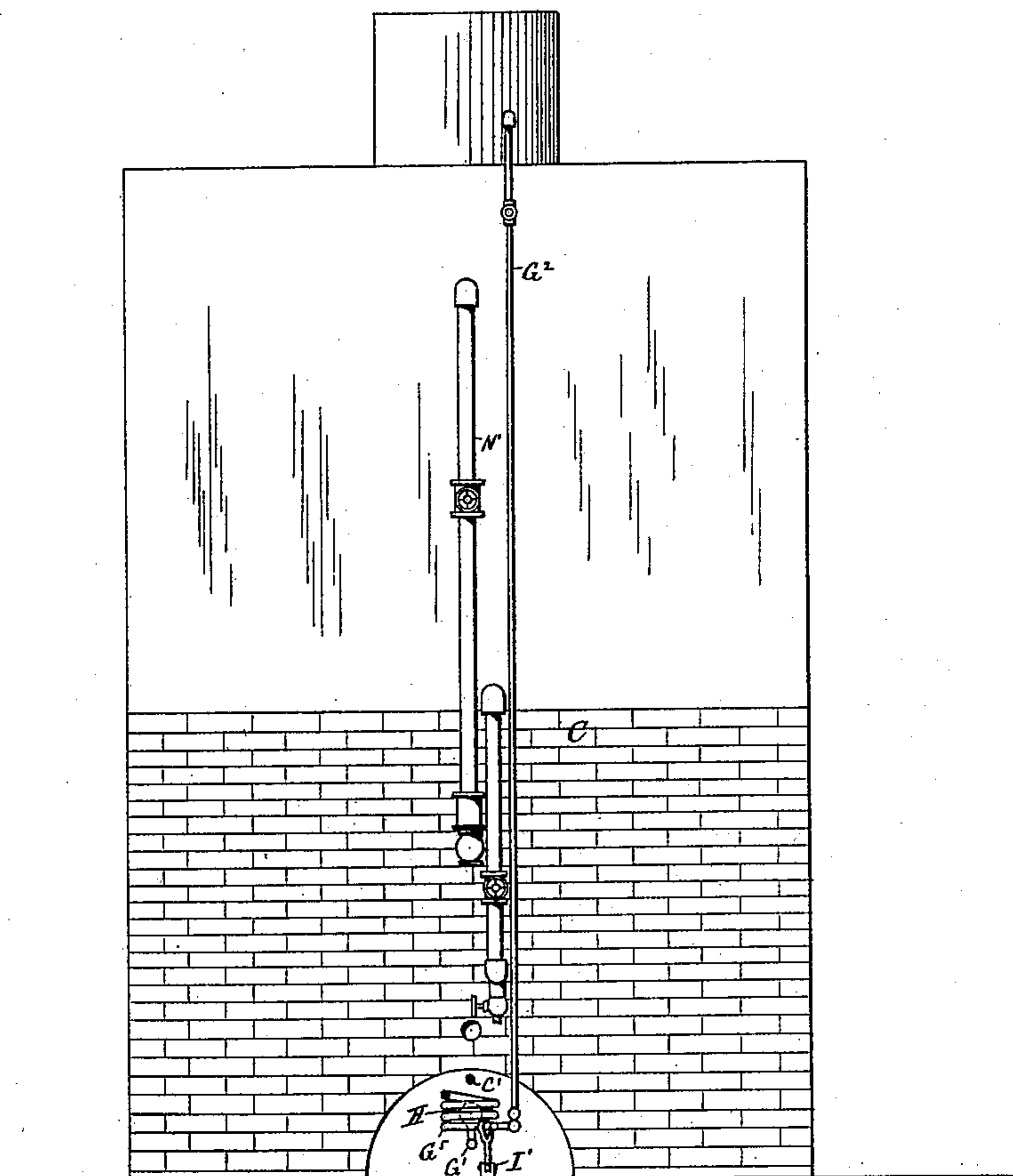


Fig. 2

WITNESSES:

W. Benjamin
Walter Adams

INVENTOR,

James F. Seery

BY

Shoet & Coe

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JAMES F. SEERY, OF NEW YORK, N. Y., ASSIGNOR TO THE EMPIRE HYDROCARBON COMPANY, OF NEW YORK.

HYDROCARBON APPARATUS.

SPECIFICATION forming part of Letters Patent No. 400,959, dated April 9, 1889.

Application filed May 24, 1887. Serial No. 239,196. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. SEERY, a citizen of the United States, residing in the city, county, and State of New York, have invented
5 a new and useful Improvement in Hydrocarbon Apparatus, of which the following, taken in connection with the accompanying drawings, is a full, clear, and accurate description.

The object of my invention is to produce
10 improvements in hydrocarbon furnaces or apparatus; and it consists, first, of a movable steam coil or superheater for superheating steam capable of being raised above the burner or lowered to its normal position at
15 will.

It also consists, secondly, of an auxiliary circulating-coil connected with the lower and upper parts of the boiler, and serving as an auxiliary heater to heat the water in said
20 boiler.

My invention also embraces a deflecting-plate and flue for deflecting the flame under the boiler, and also protecting the boiler and preventing injury to the iron.

25 It further consists in an oil-tank suitably connected with air-chamber and pump for forcing oil into the injector, and provided with a safety-pipe adapted to prevent explosion. These various parts are also united and combined in various combinations.
30

In the drawings, Figure 1 is a sectional view of my improvements. Fig. 2 is an end view of the furnace portion of my apparatus, the outside pipes being severed at the line $x x$,
35 Fig. 1.

Similar letters indicate corresponding parts.

My improvement is made as follows:

A represents a steam-boiler provided with a dome, B.

40 C is a brick-work in which the boiler A is secured. This brick-work C is provided with the arched opening C', opening into the vertical passage C², and also provided with the flue or pipe D, one end of which opens into the outer air at C³ and the other end into the
45 vertical passage at D'. The vertical passage D' is continued in horizontal position under the boiler A, forming the passage E, which enters a vertical passage, E', on the other side
50 of the boiler. The brick-work at one side and

top of the vertical passage D' is formed into a curved or slanting surface, forming a deflecting-plate, F.

G is the injector or burner composed of the pipe G', which supplies said injector with
55 live steam from the dome B, the pipe G², which supplies the injector with air from the interior passage, C², and the oil-pipe G³, leading from the oil-reservoir O, hereinafter described.

G⁴ is a mixing-chamber where the steam,
60 after passing through the pipe G' to superheating-coil G⁵, where it is superheated, is mixed with the air and oil flowing from their respective pipes, the superheated steam passing into the mixing-chamber G⁴ through a
65 suitable nozzle, g . (Shown in dotted lines.) From the mixing-chamber G⁴ the mixed oil, steam, and air passes to the burner-head H.

The oil-pipe G³ and superheating-coil G⁵ are furnished with suitable valves and cocks
70 for regulating the supply to mixing-chamber G⁴. The steam-pipe G' is also provided with a valve and stop-cock, G⁶, placed between the superheating-coil G⁵ and the mixing-chamber G⁴, in order that the steam in said pipe G' may
75 act as a cushion or buffer against the pressure developed in the mixing-chamber.

The superheating-coil G⁵ is so pivoted at h' as to be capable of being raised or lowered at will by the action of the lever L, connected
80 with said coil at I, said lever being supported in suitable pivots at I'.

M is an auxiliary coil placed in the passage C², and connected by two horizontal pipes passing through the brick-work C with the
85 boiler A. The lower horizontal pipe, m , is connected by the pipe N with the lower portion of the boiler. The upper portion, m' , of the coil M is connected with the upper part of the boiler by the pipe N', these pipes hav-
90 ing suitable valves and stop-cocks.

The oil-reservoir O, designed to be placed underground, is furnished with pipe o , leading to air chamber or receiver R, which is connected by the pipe p with an air-pump.
95 (Not shown in the drawings.) Said oil-tank O is also provided with a pipe, P, leading up and opening into the air. The pipe P is formed with a horizontal portion or joint, P', which is designed to be filled with rosin. The oil-
100

tank O is also furnished with a small stop-cock, S, to drain the oil-pipe G³ of oil when its valve is closed.

The operation of my invention is as follows:

5 The boiler A being supplied with water, the stop-cocks in the pipes N and N' are opened, allowing a circulation of water through the coil M. At the same time the valves in the oil-pipe G³ and the superheating-coil pipe G⁵ are opened, and oil is forced by the action of the air-pump from the oil-reservoir O into the mixing-chamber G⁴, where it is mixed with air coming through the air pipe or passage G². The burner-head H being lighted, the operation commences. The heat generated at this burner-head H passes upward through the center of the coil M, and is deflected by the deflecting-plate F under and through the boiler A, as shown by the arrows, an auxiliary draft being created through the air-passage D. It will thus be seen that the coil M receives and utilizes the heat in the first instance, and prevents the waste of heat which would otherwise occur, and also generates steam very quickly in said coil. This steam passing through the pipes m' and N' to the upper part of the boiler aids greatly in quickly converting the water in the boiler into steam. Steam being formed in the boiler passes from the dome B through the steam-pipe G' to the superheating-coil G⁵, where it is superheated, and thence passes through the mixing-chamber G⁴ to the burner-head H in conjunction with the intermingled air and oil. If it be desired to heat the coil M to a higher degree, the superheating-coil is raised, as shown in dotted lines, by means of the lever L, whereby it is brought more directly into contact with the flame, and, when desired, can be returned to its normal position around the burner-head. The deflecting-plate F serves to receive the first impact of the flame of the burner, and thus protects the iron of the boiler from any injurious action.

It will be seen on inspection of the drawings that when the supply of oil to the injector G is stopped by stopping the action of the air-pump any oil remaining in the injector will drain out by releasing the air-pressure through the stop-cock S. It is designed to place the oil-reservoir O at a distance from the furnace and below ground, as a precaution against fire and explosion. As an additional precaution, the oil-tank O is provided with the pipe P and its rosin-filled joint P', and if too much heat is generated said rosin will be melted,

thus allowing the vapors of the oil to have free vent to the open air.

By drawing the supply of hot air from the fire-box above the burner any unconsumed combustible material which would otherwise be wasted is drawn in with the air and again brought into the mixing-chamber.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In combination with the fire-box of a furnace, a vapor-burner located therein, and a pivoted coil of pipes forming a superheater for steam surrounding the burner, and means whereby said coil may be raised above the said burner at will, substantially as and for the purpose set forth.

2. In combination with a furnace having a hydrocarbon-burner, a superheating-coil surrounding the burner and being pivotally connected to its supply and exit pipes, a lever connected at one end to the coil-pipe, and a fulcrum for said lever, the free end of the lever being made to extend outward and adapted for prehension, as and for the purpose set forth.

3. The combination, in a furnace provided with a fire-box having an arched top forming a deflecting-plate, of a steam-generating coil placed below said arch, a vapor-burner, and a superheating-coil surrounding the burner, substantially as and for the purposes set forth.

4. In combination with the fire-box of a furnace having a suitable burner and an arched or curved deflecting-plate, a draft-pipe opening into the fire-box above the deflecting-plate, a steam-generating coil placed below the deflecting-plate and above a burner, and a superheating-coil surrounding the burner, substantially as described.

5. In combination with the fire-box of a furnace, a hydrocarbon-burner, a steam-superheating coil, a mixing-chamber, pipe for supplying oil to said mixing-chamber, an air-pipe leading from the fire-box above the burner and connected to the mixing-chamber, and a steam-pipe connected to the superheating-coil and mixing-chamber, forming an injector, all substantially as shown and described.

In witness whereof I have hereunto set my hand this 12th day of May, 1887.

JAMES F. SEERY.

In presence of—

R. T. VAN BOSKERCK,
CHARLES G. COE.