

1,022,263.

2 SHEETS—SHEET 1.



Witnesses
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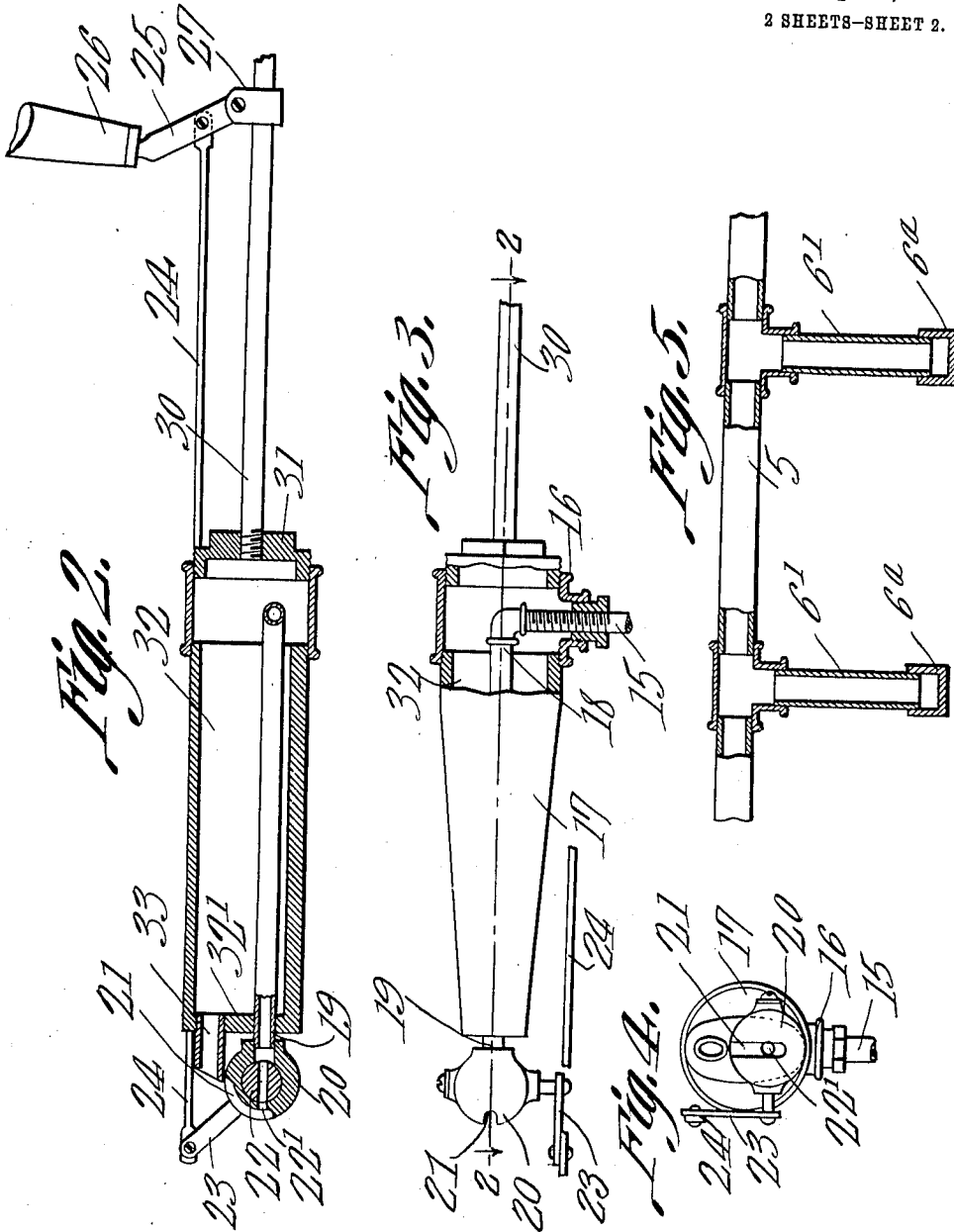
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 FLUID HYDROCARBON BURNER.
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Patented Apr. 2, 1912.

2 SHEETS-SHEET 2.



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UNITED STATES PATENT OFFICE.

PETER ROOT, OF EUREKA, CALIFORNIA.

FLUID-HYDROCARBON BURNER.

1,022,263.

Specification of Letters Patent.

Patented Apr. 2, 1912.

Application filed June 9, 1911. Serial No. 632,254.

To all whom it may concern:

Be it known that I, PETER ROOT, a citizen of the United States, residing at Eureka, in the county of Humboldt and State of California, have invented a new and useful Fluid-Hydrocarbon Burner, of which the following is a specification.

This invention relates to improvements in fluid hydrocarbon burners, and the primary object of the invention is the provision of an apparatus for generating steam from water, said apparatus being heated by the flames from the fluid hydrocarbon burner itself, and conducting the steam generated therefrom into the vaporizing or heating receptacle or casing of the fluid hydrocarbon burner, where the fluid hydrocarbon, particularly low grade or semi-fluid oil, is supplied by gravity and is heated and carried away from the burner by means of the spray with the steam, the said fluid hydrocarbon being atomized to produce the desired result.

A further object of the invention is the provision of a steam generating coil so disposed and mounted as to receive the heat from the fluid hydrocarbon burner, in such way that the said heat does not directly contact the coil yet produces the desired steam pressure for producing a highly inflammable superheated atomized spray of fluid hydrocarbon.

A still further object of the invention is the provision of a fluid hydrocarbon burning apparatus in which a steam generating coil is provided, said coil being so constructed as to be readily mounted within the combustion chamber of an ordinary furnace, steam or hot water boiler whereby steam from the water supplied to said coil, is generated and conducted in a superheated condition to be intermingled with the oil, whereby a highly inflammable and combustible spray of atomized oil is injected within the combustion chamber of the furnace.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings—Figure 1 is a perspective view of the complete apparatus, in operable relation, installed in a furnace or boiler, said boiler being shown by dotted lines. Fig. 2 is a longitudinal sectional view taken on the line 2—2 of Fig. 3. Fig. 3 is a bottom plan view of the fluid hydrocarbon burner. Fig. 4 is an end view thereof. Fig. 5 is a detail view showing the leg and sediment collecting means of the coil.

Referring to the drawings, the numeral 1 designates the water supply pipe provided with the hand operated valve 2, which leads to the forward end of the coil as at 3, the said coil having the member 4 connected to the member 5, both members 4 and 5 being provided with the downwardly projecting and communicating vertically arranged supporting legs 6 and 6', said legs being in communication with the lower members of the coil and provided with the closure caps 6^a, whereby the proper supports are provided for the coil, and at the same time a series of sediment receiving chambers are provided. By this means any scale within the coils 7, 8, 9 and 10 is precipitated within these legs, where it may be removed by simply removing the caps 6^a therefrom.

As shown the upper coil 10 is of shorter length than the other coils and that each succeeding coil is slightly longer thereby providing at the forward portion an inclined relation with one another, each one of said coils being U-shaped in plan, thus providing an opening at the bottom, end and top, the purpose of which will presently appear.

Leading from one terminal of the upper coil 10 is a downwardly and outwardly inclined conduit or pipe 11, having an elbow connection with the pipe 12, which leads to the steam trap and filtering device 13, whose upper portion has leading therefrom a pipe 14, which by means of a series of elbows as at 15 is connected to the coupling 16, of the burner casing 17. The pipe or coupling 16 communicates with the pipe 18 which is located within the chamber 32 of the burner casing 17 and projects exteriorly of the end 32' thereof as at 19, where it is connected to a pet cock casing 20 which is provided with a slot 21. Mounted in the pet cock casing is a valve or cock 22, which is provided with the usual outlet 22', and this valve is operated by an arm 23, connected by the long

link 24 to the lever 25, which is provided with a handle for operating the same and is connected for operation by means of the link or pivoting collar 27. It will thus be
 5 seen that the hollow burner casing 17, is circular in cross section at its inlet end, and elliptical in cross section at its outlet end, and therefore as particularly shown in Fig. 3 that the side walls converge, while the top
 10 and bottom walls as shown in Fig. 2, are in parallel. By this means it will be seen that the steam generated in the coils will pass through the filtering and drying compartment 13, where any precipitant or heavy
 15 substance will be filtered from the steam so that nothing but the dry and filtered steam will enter the pipe 18 within the burner casing and be projected through the stop cock casing 20, which projection is controlled through the medium of the lever 26
 20 and its connections.

Leading from the proper fuel supply is a pipe 28 controlled by a hand valve 29, a branch 30 of said pipe entering through the
 25 plug 31 in the end of the coupling 16 of the burner casing 17, this pipe 30 entering directly into the chamber 32 thereof, to fill the chamber with a heavy fuel oil. The steam emitted from the slot 21 of the pet cock 20,
 30 will atomize the oil, emitted from the outlet or nozzle 33 of the casing 32, and direct the same in an upwardly inclined direction, as shown in Fig. 1, so that the flame caused by the
 35 ignition of the oil and superheated steam, will be projected below the lower coil of the steam generating apparatus and not directly in contact therewith, the heat however from the flames so affecting the coils as to generate the desired amount of
 40 steam to produce the atomizing effect at the outlet end of the burner casing 17.

It is evident that an apparatus constructed according to this invention, will provide a means whereby the use of a fluid hydrocarbon will be economical and by reason of
 45 the steam atomizing the oil, the desired atomizing will be effected with an exceedingly simple mechanism.

The fluid hydrocarbon burner casing 17 with its steam ejecting nozzle and oil outlet
 50 33 is so arranged and supported that it will project the spray of superheated steam and oil upwardly at an angle and, directly below the lower coil and between the remaining
 55 coils, thus preventing the coils from being placed in the direct flames from the burner, thus increasing the life of the coils and at the same time permitting the generation of steam as may be desired. Any suitable support for the burner to assume this position
 60 may be employed, but the connections 14 and 15 will, in ordinary cases, form the suitable support for the casing 17 and its attending portions.

65 As shown in Fig. 3, the side walls of the

casing 17 converge, while the top and bottom walls, as shown in Fig. 2 are in parallel, and by the arrangement of the steam pipe 18 within said chamber, the oil contained therein is properly heated so that there will be no
 70 difficulty in the atomizing of the oil as it drips into the stream of steam sprayed from the cock 20.

What is claimed is:

1. A fluid hydrocarbon burner having a
 75 casing in communication with an oil supply at one end thereof, a steam conducting pipe mounted within the casing and projecting through the outward end of the casing below the center line thereof, the other end of
 80 the steam pipe being in communication with a steam supply, a nozzle connected to the extended end of said pipe exteriorly of the casing, a valve mounted in said nozzle for controlling the emission of steam therefrom,
 85 and an oil nozzle disposed above and in co-operative relation with the steam nozzle.

2. A fluid hydrocarbon burner having a casing in communication at one end with an oil supply, a steam conducting pipe mounted
 90 within said casing and in communication with a steam supply at one end thereof, the other end of said pipe projecting beyond the end of the casing below the center line thereof, a nozzle connected to said extended
 95 end of said pipe for conveying the steam away from the casing, a valve for controlling the emission of steam therefrom, and a continuously opened oil feed nozzle leading from the casing and disposed to drip
 100 the oil from above upon said steam nozzle.

3. A burner having a casing circular in cross section at its inlet and elliptical in cross section at its outlet end, the inlet end of said casing being in communication with
 105 an oil supply, a steam conducting pipe mounted within said casing and projecting from the outlet end thereof, a nozzle connected to the outer end of said pipe exteriorly of the casing, a valve for controlling the emission of steam therefrom, and an oil feed nozzle disposed in the outlet end of the casing above the steam nozzle to feed the oil directly upon said steam nozzle.

4. A fluid hydrocarbon burner, having a
 115 casing the inlet end of which is circular in cross section and which gradually tapers toward the outlet end which is elliptical in cross section, the inlet end of said casing being in communication with an oil supply,
 120 a steam conducting pipe disposed longitudinally within the casing and extending from its inlet end to and through the outlet end thereof, the outer end of the steam pipe being below the central line of the casing,
 125 a nozzle connected to the outer end of said steam supply pipe, a valve for controlling the flow of steam therefrom, means for actuating said valve, and an oil nozzle disposed in the outlet end of the casing above
 130

the central line thereof and having its discharge end disposed slightly in the rear of and above the outlet of the steam nozzle, whereby oil fed therefrom will drip upon
5 the steam nozzle to be atomized with the steam.

In testimony that I claim the foregoing

as my own, I have hereto affixed my signature in the presence of two witnesses.

PETER ROOT.

Witnesses:

A. M. SMITH,

H. D. NIXON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
