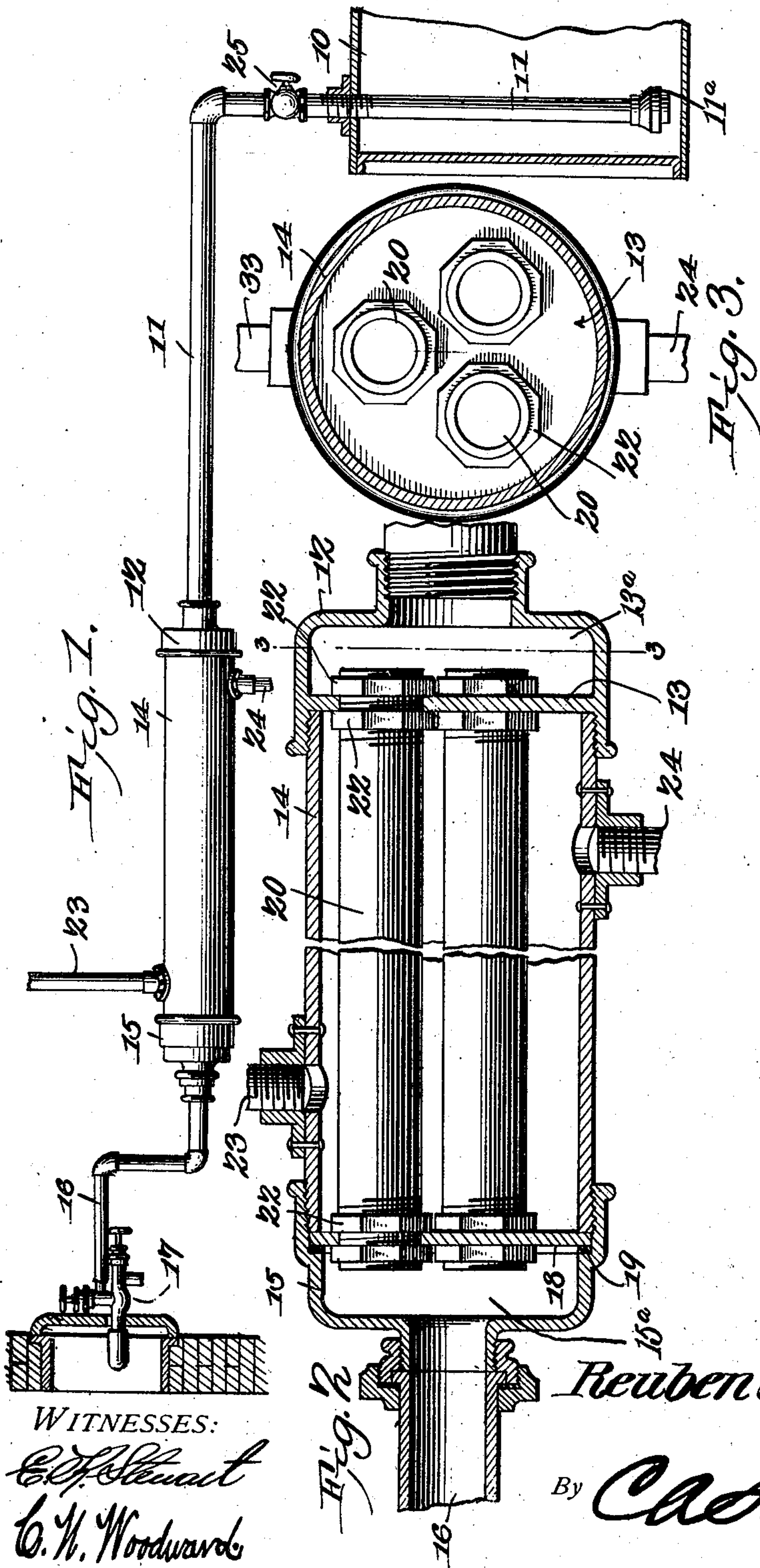


No. 847,496.

PATENTED MAR. 19, 1907.

R. C. NELSON.
VAPOR BURNER.

APPLICATION FILED MAR. 9, 1906.



WITNESSES:

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UNITED STATES PATENT OFFICE.

REUBEN C. NELSON, OF HEALDSBURG, CALIFORNIA.

VAPOR-BURNER.

No. 847,496.

Specification of Letters Patent.

Patented March 19, 1907.

Application filed March 9, 1906. Serial No. 305,150.

To all whom it may concern:

Be it known that I, REUBEN C. NELSON, a citizen of the United States, residing at Healdsburg, in the county of Sonoma and State of California, have invented a new and useful Vapor-Burner, of which the following is a specification.

This invention relates to apparatus in which liquid fuel is employed, more particularly to devices of this character in which crude oil is employed as a fuel.

The device is designed for use in connection with furnaces of various kinds. For the purpose of illustration the device is shown applied to an ordinary steam-generator furnace.

Figure 1 is a side elevation of the device applied, the portion of the furnace and the portion of the reservoir or tank containing the supply of fuel being in section. Fig. 2 is a longitudinal sectional view of the heater portion of the apparatus. Fig. 3 is a transverse section on the line 3 3 of Fig. 2.

The improved device comprises a burner, a supply-tank for the fuel located at any suitable distance from the burner and preferably below the line of the same, and a heater for the liquid fuel between the burner and tank. The tank is represented at 10 with a suction-pipe 11 extending therefrom and provided with a check-valve at 11^a, preferably near the lowest point of the tank or reservoir. The pipe 11 leads to a cap 12, having a transverse partition 13 and connected, preferably by threading, to one end of a relatively large shell or pipe 14. The partition 13 and the end of the cap 12 form a comparatively broad shallow compartment 13^a, into which the pipe 11 opens. Connected, preferably by threading, to the other end of the shell 14 is another cap 15, the latter having a pipe 16 leading therefrom and constituting the feed-pipe to the burner, (represented as a whole at 17.) Within the cap 15 is a disk plate 18, bearing against the end of the shell 14 and held in place by a shoulder 19 within the cap 15. A comparatively broad but shallow compartment 15^a is formed between the plate 18 and the end of the cap 15 into which the pipe 16 opens.

The partitions 13 and the plate 18 are pierced with numerous apertures for receiving a plurality of tubes 20, the tubes threaded

at the ends and supplied with clamp-nuts 22, by which they are secured to the partition 13 and plate 18. A steam-pipe 23 leads into the shell 14 at one point, and an exhaust-pipe 24 leads therefrom at another point. It will therefore be seen that oil entering the compartment 13^a will be heated to a certain extent by the steam contacting with the partition 13, this resulting from the fact that the compartment 13^a is very shallow. From this compartment the oil will pass through the tube 20 and be further heated by the steam contacting with said tube and will finally be discharged into the compartment 15^a, which is also very shallow, as heretofore stated, and the oil will therefore be maintained in a heated condition until its discharge through the pipe 16. By providing the two shallow compartments 13^a and 15^a the oil is not only distributed therefrom to the several tubes employed, but is also heated to a greater degree than would be the case if the oil should be discharged directly from the pipe 11 into one of the tubes 20.

The steam employed in the shell 14 is generally the exhaust-steam from the engine, but may be supplied from any source, or hot air may be employed instead of steam if found more convenient or advantageous.

The pipe 11 is supplied with a controlling-valve 25.

The fuel being supplied to the burner in a heated condition vaporizes much more rapidly than when supplied in cold condition and is therefore used with a greater economy and produces a materially greater heat by the consumption of the same amount of fuel.

Having thus described the invention, what is claimed as new is—

In an apparatus of the character described a fuel-heater comprising a cylindrical shell having a steam-inlet and a steam-outlet with in opposite portions thereof, a plate upon one end of the shell, a plurality of tubes secured within the plate and extending longitudinally within the shell, an internally-screw-threaded cap engaging one end of the shell and having an interior shoulder bearing upon the plate to clamp against the shell, a fuel-outlet extending from the center of said cap, said cap forming a shallow compartment into which one end of the tubes open, an internally-screw-threaded cap upon the oppo-

site end of the shell, an integral partition within said cap in which one end of the tubes is secured, there being a shallow compartment within the cap into which the tubes
5 open, and a tubular inlet at the center of said cap, said tubes being disposed out of alignment with the inlet and outlet.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

REUBEN C. NELSON.

Witnesses:

REUBEN E. BAER,
JOHN L. BATES.