

UNITED STATES PATENT OFFICE.

CHARLES A. KUNZEL, JR., OF HOBOKEN, NEW JERSEY.

APPARATUS FOR BURNING HYDROCARBON OR OTHER OILS.

SPECIFICATION forming part of Letters Patent No. 607,863, dated July 26, 1898.

Original application filed May 15, 1894, Serial No. 511,320. Divided and this application filed December 10, 1895. Serial No. 571,687. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. KUNZEL, Jr., a citizen of the United States, residing at Hoboken, in the county of Hudson, State of New Jersey, have invented a new and useful Improvement in Apparatus for Burning Hydrocarbon or other Oils, which improvement is more fully set forth in the following specification and accompanying drawings.

My invention consists of an improved construction of apparatus for burning hydrocarbon and other oils, the latter being conducted under pressure to a burner of novel construction having a portion of its shell located within the furnace, whereby the combustible is vaporized prior to ignition.

It further consists of novel details of construction, all as will be hereinafter fully set forth, and particularly pointed out in the claim.

Figure 1 represents a side elevation of a vertical furnace and its adjuncts embodying my invention, the lower portion of said furnace being shown in section. Fig. 2 represents a longitudinal sectional view of a horizontal furnace and its adjuncts, illustrating another embodiment of the principle of my invention. Fig. 3 represents a longitudinal section, on an enlarged scale, of a valve embodying my invention.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings, A designates a furnace-casing, and B a tank supported within the same, said tank being provided with a purifier C, if desired. D designates a reservoir having a valved inlet-pipe E, which is adapted to have a connection to an air-pump, the hydrocarbon or other combustible employed being introduced through the valved opening F, the said tank B being provided with a suitable gage G, if desired.

H designates a supply-pipe leading from the bottom of the reservoir D and having therein the valve J of ordinary construction. The lower extremity of the pipe H communicates with the valve K, provided with a valve-stem L¹⁰, which is shown in section on an enlarged scale in Fig. 3, said valve comprising a shell which projects into the lower por-

tion of the furnace-casing, the inner plug L, which fits closely within said shell and has a port L' therein, which is adapted to register with the supply-pipe H, and thereby form a conduit for the heating medium to the perforated pipe M through the nozzle M' of reduced diameter, whereby not only is the combustible employed introduced into the discharge-pipe at a greatly-increased pressure, but an annular expansion-chamber is formed adjacent to and extending to the rear of the nozzle M, which permits the storage of any excess of combustible, which acts as a reserve to make up any deficiency in the supply entering said nozzle. The said pipe M terminates in convolutions under the tank B and is provided with perforations N therein.

The shell K is preferably made of a body portion K' and cap K², which are suitably secured together by bolts K³, the said cap having an enlarged portion or boss in which the stem of the plug or valve L has a bearing.

P, Q, and R designate a blow-off, smoke-stack, and gage, respectively, which may be of usual construction.

S designates inlets for air to aid combustion.

T and U designate eduction and induction pipes for the tank B.

The furnace shown in Fig. 2 is substantially the same as the one seen in Fig. 1, except that the tank B is arranged horizontally instead of vertically, and the space between the same and the casing A is provided with horizontal baffles or deflectors V, the outer ends of which have the openings W for the passage of the products of combustion, whereby the latter are compelled to take a sinuous course relative to the tank, thereby giving up the major portion of their heat-units before escaping through the stack Q.

The operation is as follows: The reservoir D having been supplied with the hydrocarbon or other combustible employed, the air under pressure is introduced thereinto through the pipe E, and the valve J being open and the hollow plug L of the valve K being turned into the position seen in Fig. 3 it will be evident that the heating medium will be forced under a high pressure into the pipe M, especial attention being called to the fact that

since the plug L and nozzle M' of the valve K are partly within the furnace it (the valve) will become highly heated and so cause vaporization of the heating medium as it flows
5 into and through said valve K, the resulting vapor or gas entering the pipe M, through which it escapes through the perforations N, as stated.

10 The operation is the same in Fig. 2, except that the products of combustion are retained for a considerable period within the casing, adjacent the retort, before reaching the stack by reason of the baffles or deflectors, as will be evident.

15 The tank B, through the medium of the eduction and induction pipes U and T, may form part of the circuit of an organized ice-machine, the general construction of which is disclosed in an application filed by me May
20 15, 1894, Serial No. 511,320, of which the present case is a division, the office of the aforesaid tank being to receive a chemical adapted for making a gas adapted for freezing purposes, the said gas after having performed its

function being returned to the tank by the 25 pipe U.

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

An apparatus for burning hydrocarbon and 30 other oils, consisting of a furnace-casing, a shell fitting in a wall of said casing, a perforated discharge-pipe leading from said shell within said casing, a supply-pipe leading into said shell exterior to said casing, a hollow 35 plug closely fitting in said shell and having an opening in its side registering with said supply-pipe and provided with a nozzle projecting into said discharge-pipe, whereby an annular expansion-chamber is formed adja- 40 cent to and extending in the rear of said nozzle, and a stem connected with said plug and mounted in the wall of said shell, and provided with a handle outside of said casing.

CHARLES A. KUNZEL, JR.

Witnesses:

AMBROSE STOLZENBERGER,
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