

(No Model.)

E. C. BURGESS.

APPARATUS FOR BURNING HYDROCARBON OILS.

No. 346,464.

Patented Aug. 3, 1886.

Fig. 1.

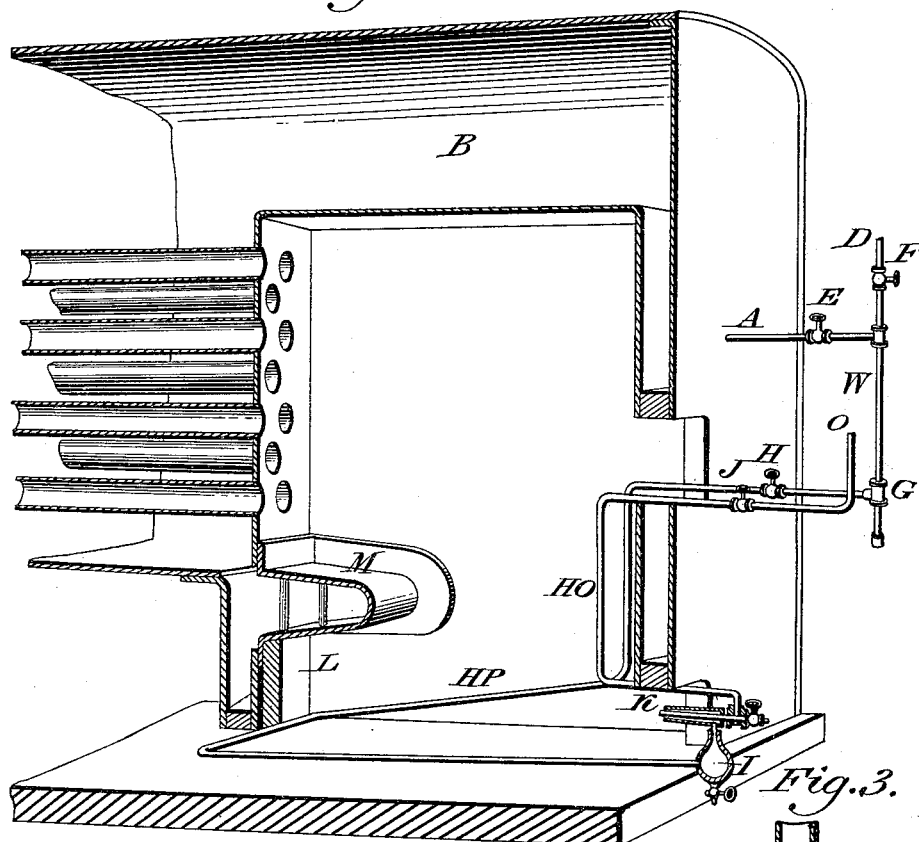


Fig. 2.

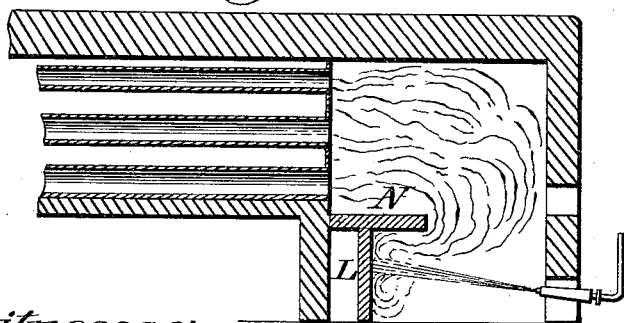
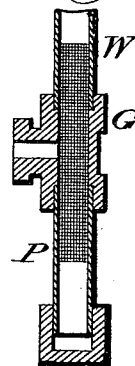


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

EDWARD C. BURGESS, OF PHILADELPHIA, PENNSYLVANIA.

APPARATUS FOR BURNING HYDROCARBON OILS.

SPECIFICATION forming part of Letters Patent No. 346,464, dated August 3, 1886.

Application filed January 12, 1886. Serial No. 188,328. (No model.)

To all whom it may concern:

Be it known that I, EDWARD C. BURGESS, a citizen of the United States, residing at 643 North Thirty-fifth street, Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain Improvements in Apparatus for Burning Hydrocarbon Oils, of which the following is a specification.

My invention relates more particularly to such apparatus as applied for generating steam and heating large areas; and the object of my improvement is to overcome the difficulties experienced in other apparatus by the clogging of retorts and pipes, the destructive action of the intense heat, the unsteady action of the fire, and the need of an auxiliary boiler to supply steam for the apparatus, all of which are by my improvements entirely avoided. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of a steam-boiler, showing the entire apparatus as placed therein. Fig. 2 is another boiler, showing a different form of baffle to form combustion-chamber. Fig. 3 is a water-filter, which can be very simply attached to the apparatus.

Letters in each view indicate the parts referred to in the specification.

In Fig. 1, B is a section of a boiler. W is a water-pipe, having two sources of supply—one through branch D from either a main or pressure-tank, the other through branch A from the boiler. This pipe, having two valves, E F, leads to a filter, G, (see Fig. 3,) and needle-valve H; thence, passing into the furnace, is carried along the right side, constantly descending to the back or baffle wall, L; thence clear across the furnace to left side; thence out through draft-opening to an air or steam chamber, I. O is an oil-pipe, which, from any source of supply, leads to needle-valve J, thence into furnace and out to injector K. Either the water or oil pipe may be any shape adapted to the furnace employed. L is a baffle-plate or back wall composed of fire-brick or any such refractory material; M, a shelf or apron connected to the water-space of the boiler, which apron and fire-brick wall, extending across the fire-box, form both a combustion-chamber for the more complete union

of the gases, and also serve to distribute the flame to every part of the furnace.

Fig. 2 is intended to represent a boiler of ordinary construction, which is not provided with a water-apron or deflector. In such boilers I place a wall of fire-brick, &c., and across the top of the wall lay slabs of the same material, substantially in the manner shown. This acts like the water-apron in Fig. 1, but does not, like the apron, add more heating-surface. It is, however, equally as good as a deflector and combustion-chamber.

Fig. 3 represents a filter formed by simply rolling very fine brass wire-gauze into cylindrical form and filling the water-pipe W. The wire-gauze, extending through the "T" and partially into a capped pipe, P, can, by unscrewing the latter, be readily drawn out and cleaned. Its object is to prevent dirt and vegetable matter in the water from clogging either needle-valve H or pipe H P.

In making a fire, the operation is as follows: A few sticks, shavings, or pieces of greasy waste are thrown in upon several parts of the pipe H P and ignited. After they have burned thereon a few minutes, open the valve F, letting water from pressure-tank or main to needle-valve H. Gently and slightly open needle-valve H, and a fine stream of water passing into the now hot pipe H P is converted into steam, and entering steam-chamber I passes from it into the outer cylinder of injector K, from which it issues as a fine cylinder of steam with great force. The needle-valve J is then opened, and the oil passing into pipe H O enters the interior of injector K, where it is caught by the rushing steam and hurled with great force against the slab or wall L. The vapor thus formed being ignited by the material still burning on the pipe H P, the whole fire-box is filled with flame, which, heating the pipes H P and H O, increases their effectiveness until a dry superheated steam is hurling a fluid mostly vapor and gas, instead of oil, into the furnace. The force of impact breaks into fine particles any oil not already made vapor by heat. The vacuum produced by the force of the jet draws into the center of flame a strong current of air, so that the hydrocarbon vapor, the superheated steam, and air are thoroughly inter-

mixed, and the combustion-chamber holds them until their combination is complete, the result, with any kind of oil, being a pure and smokeless fire.

5 As it is desirable to use the least possible amount of piping within the furnace, so that it may be fully protected from heat by the water and oil passing through it, I add the chamber I to increase the cubic area, and thus by
10 the elasticity of the steam secure a steady and regular flow from the injector K.

After a sufficient pressure of steam is generated in the boiler B, the valve E is opened, allowing the hot water at the boiler-pressure
15 to flow into pipe H P, and valve F and pressure-tank, having served their purpose of starting the fire, are shut off.

I am aware that the combination of a baffle-plate backed by a water-chamber and sur-
20 mounted by a shelf of refractory material is not new, and this I disclaim.

I am aware that pipes, injectors, &c., have

been used for similar purposes prior to my invention, and I do not claim them, broadly; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In an apparatus for burning hydrocarbon oils, the combination of an inlet-pipe, W, with a filter, G, a heating pipe or coil, H P, an equalizing-chamber, I, and an injector, K, all substantially as shown.

2. In an apparatus for burning hydrocarbon oils, the combination of a water shelf or apron, M, with a baffle plate or wall, L, and injector K, substantially as shown.

3. The combination of the heating-coil H P, equalizing-chamber I, and injector K, substantially as shown and described.

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Witnesses:

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