

M. CARBONEL.

Apparatus for Burning Hydrocarbons.

No. 140,009.

Patented June 17, 1873.

Fig 1.c

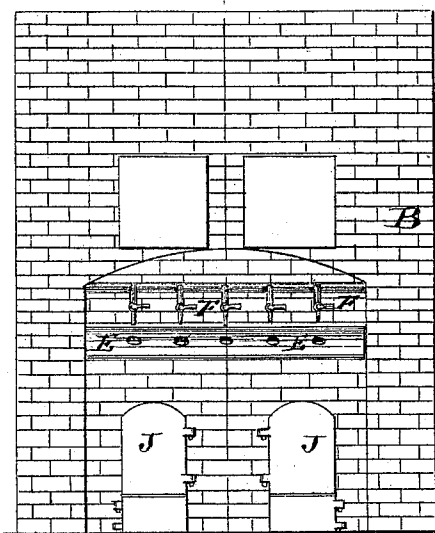


Fig. 3.

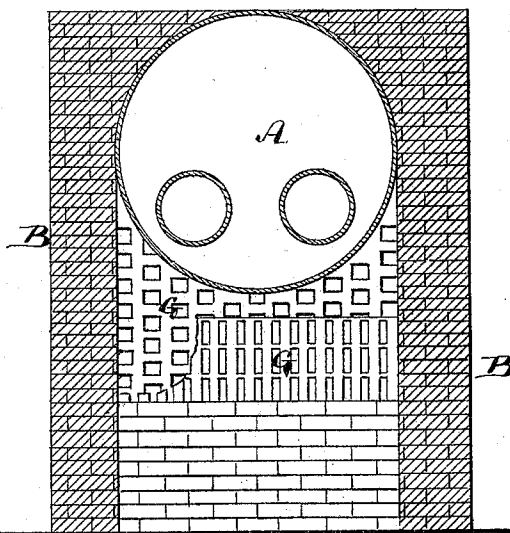
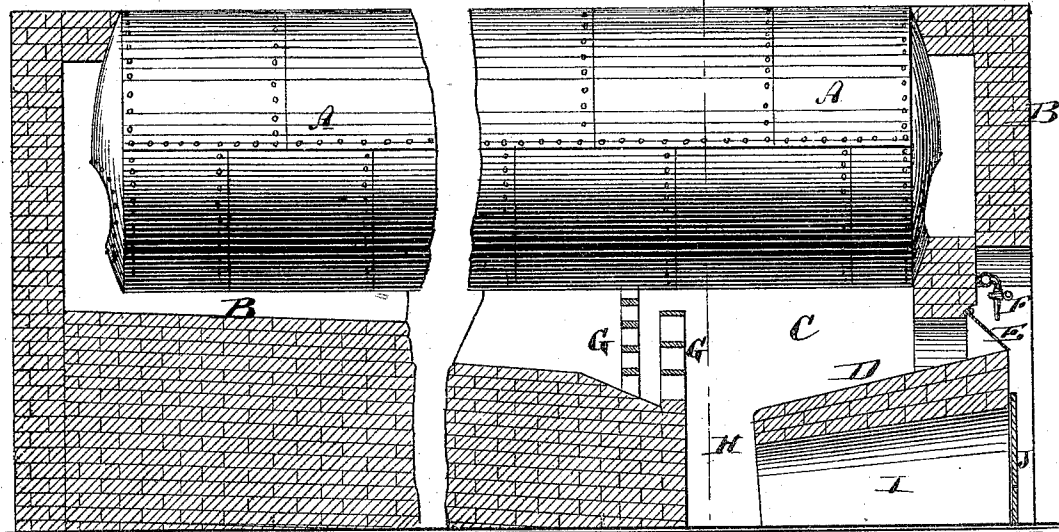


Fig. 2.



Witnesses:
John Becker
Fred Wayne

Mr. Carbonel
by his attorney
Brown & Allen

UNITED STATES PATENT OFFICE.

MANUEL CARBONEL, OF HAVANA, CUBA, ASSIGNOR OF ONE-HALF HIS
RIGHT TO JOSÉ BENITO PEREZ, OF SAME PLACE.

IMPROVEMENT IN APPARATUS FOR BURNING HYDROCARBONS.

Specification forming part of Letters Patent No. 140,009, dated June 17, 1873; application filed
March 27, 1873.

To all whom it may concern:

Be it known that I, MANUEL CARBONEL, of Havana, in the Island of Cuba, have invented an Improved Furnace for Burning Liquid Fuel, of which the following is a specification:

This invention relates to a new furnace for burning hydrocarbon, or other inflammable liquids, for the purpose of heating boilers, retorts, stills, and other articles, such liquid fuel to be a substitute for the coal and other solid fuel now usually employed in such cases. My invention consists in constructing the bottom of the fire-place of an inclined plate, to which, through a perforated face-plate, fuel is supplied at its upper end, and whereon the fuel flows down while being ignited. Air-channels are arranged under this inclined surface, and lead from without into the lower part of the fire-place, but in front of one or two perforated fire-bridges, so that the requisite amount of oxygen will be supplied to the fire after the same has been started—that is to say, the oxygen supply will take place behind the flame originally started, thus causing a complete combustion of the gases that would not have been burned by the original process of ignition. My invention also consists in the arrangement of perforated fire-arches behind the fuel-supporting inclined plane, and behind the space for the admission of air to the flame, as hereinafter more fully described.

In the accompanying drawing, Figure 1 represents a front elevation of my improved furnace when the same is arranged beneath a boiler. Fig. 2 is a vertical longitudinal section of the same taken on the plane of the line *c c*, Fig. 1. Fig. 3 is a vertical transverse section on the line *k k*, Fig. 2.

Similar letters of reference indicate corresponding parts.

The letter A in the drawing represents a boiler or vessel to be heated by the flame of liquid fuel. This boiler or vessel is of suitable kind or construction, and is supported on a suitable frame-work or casing, B, so that it will be above the fire-place C. The bottom of this fire-place is constructed in form of an

inclined platform, D, of fire-brick or other material, which platform is higher at its front than at its back end, as is clearly shown in Fig. 2. A perforated plate, E, covers and closes the front opening to the fire-space C, and communicates by the perforations with a series of fuel-supply pipes, F F. These pipes F are provided with valves or cocks, respectively, and communicate, by a conduit not shown, with a reservoir containing the fuel. When the cocks or valves in the pipes are opened the fuel will flow through these pipes and through the perforations of the plate E upon the outer or upper end of the inclined fire-board or platform D, and will then flow down on the surface of such platform. On the latter the fuel is ignited, so that the flames will strike the boiler or vessel A. G G are two perforated fire-bridges placed back of the platform D, and constituting partial walls in the fire-space. Between the front bridge G and the inner end of the platform D there is a space, H, which communicates with air-channels I I that are arranged beneath the platform D. The front ends of these air-channels can be closed by suitable doors J.

Whenever the furnace is to be used and the liquid fuel is supplied to the platform D, the doors J are more or less opened, and the fuel is ignited on the platform D. In an ignited condition it will flow down on said platform until entirely consumed, and the gases of combustion or flames will become mingled with the air that ascends in the space H, so that complete combustion will take place directly in front of, between, and behind the bridge G.

By this system of construction a safe furnace for consuming liquid fuel is produced, and a very economical means of heating boilers, &c., provided.

It will be noticed that the perforated plate E, when arranged as a shield or cover to the fire-space and as a conveyer of the liquid fuel, serves a double purpose, to wit: It being a short distance from the ends of the supply-pipes F, as shown in Figs. 1 and 2, prevents such pipes from becoming heated, and from consequently endangering the safety of the

apparatus, permitting also the fuel, before it reaches the plate, to absorb oxygen from the atmosphere and be in better condition for combustion. It also serves as a shield to the fire-space, preventing the flames from striking out, although heating the fuel by contact, and further preparing it for complete combustion. The perforated fire-bridges G G are also of the greatest importance. They serve, like ordinary bridges, to retard the flames, and to some extent confine them to the fire-space; but possess the additional advantage of making combustion almost absolute by having the heated walls of their apertures add their effect to the currents of fresh air that reach the flames from below. Instead, therefore, of passing the whole bulk of the flames and gases through a narrow neck, as is usually done, they are divided and redivided into a series of small currents, each of which passes through an aperture, of which the walls are

heated almost to incandescence, and the inflammable contents of such small currents are consequently more apt to be completely burned than they would be if not exposed to so large an area of heated substance.

What is here claimed, and desired to be secured by Letters Patent, is—

1. An inclined platform, D, arranged in conjunction with a perforated supply-plate, E, in a furnace for burning liquid fuel, when such plate E is arranged beneath, and at some distance from, the supply-pipes F, substantially as set forth.

2. The combination of the perforated fire-bridges G with the inclined platform D, perforated supply-plate E, and channels I, as described.

MANUEL CARBONEL.

Witnesses:

JOS. A. RAPHEL,

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