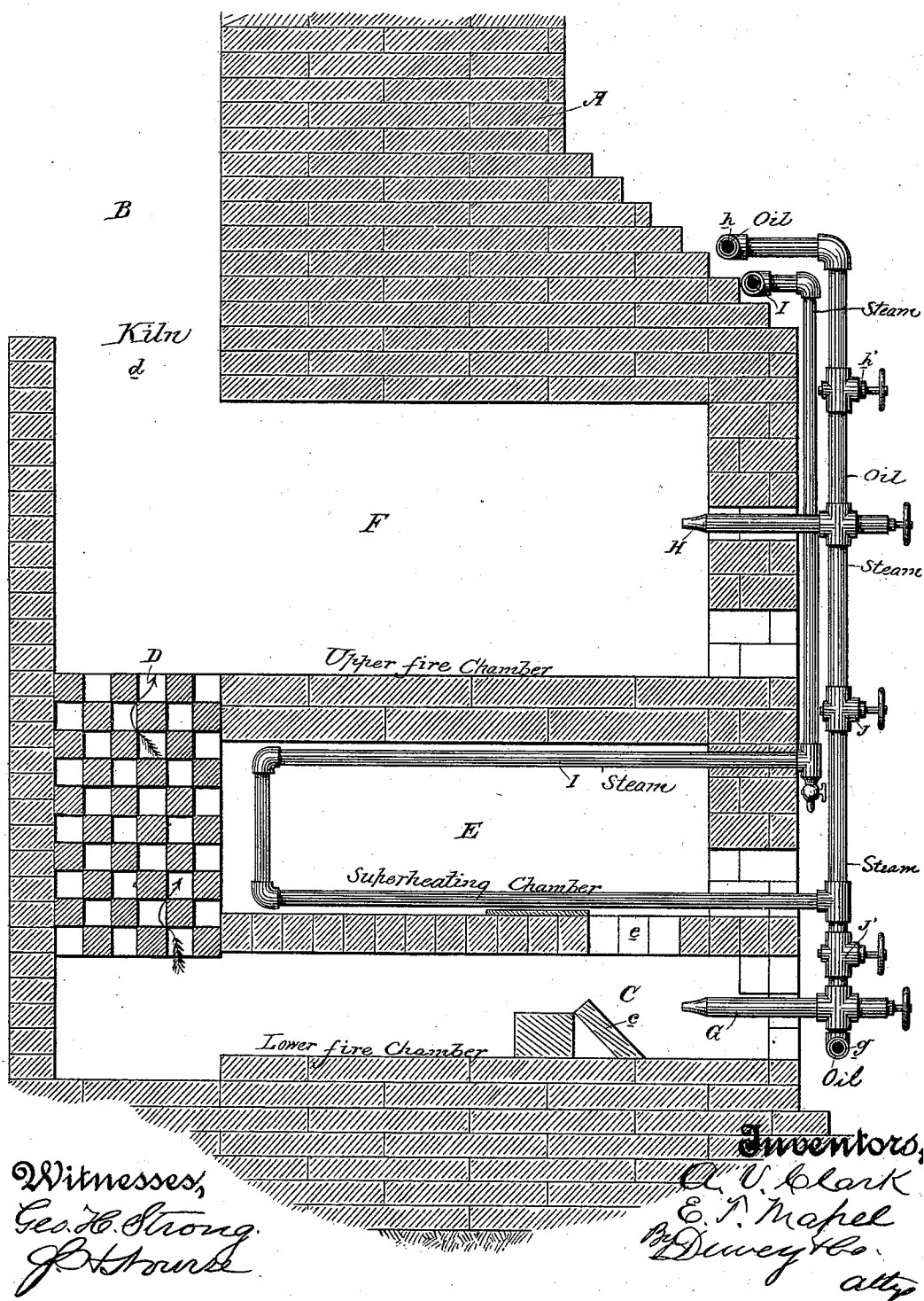


(No Model.)

A. V. CLARK & E. T. MAPEL.
OIL BURNING LIMEKILN.

No. 396,541.

Patented Jan. 22, 1889.



UNITED STATES PATENT OFFICE.

ALBERT V. CLARK AND ELIGHA THOMAS MAPEL, OF ALAMEDA, CALIFORNIA.

OIL-BURNING LIMEKILN.

SPECIFICATION forming part of Letters Patent No. 396,541, dated January 22, 1889.

Application filed August 17, 1888. Serial No. 283,005. (No model.)

To all whom it may concern:

Be it known that we, ALBERT V. CLARK and ELIGHA THOMAS MAPEL, of Alameda, Alameda county, State of California, have invented an Improvement in Oil-Burning Furnaces; and we hereby declare the following to be a full, clear, and exact description of the same.

Our invention relates to the class of furnaces which are especially adapted for the burning of oil, and especially to those furnaces for making sewer-pipe, pottery, fire-bricks, &c., in which a circular shell incloses the kiln and is provided with a number of fire-places.

Our invention consists in the novel arrangement of the fire-chambers, oil-burners, and supply-pipes, steam-pipe, and superheating-chamber, as we shall hereinafter fully describe.

The object of our invention is to provide for burning oil in a furnace of this character and a means for employing a low fire at the beginning of the operation, the heat from said fire being also utilized to heat the steam which is furnished to the burner, and after the necessity for a low fire has passed to provide for employing a fire-chamber and burner for the subsequent high fire.

Referring to the accompanying drawing for a more complete explanation of our invention, the figure is a vertical section of one portion of the shell of the general furnace, showing the location and arrangement of one set of fire-chambers, oil-burners, and steam-pipes.

A is the shell of the furnace, inclosing the kiln B. In the base of this furnace is made the fire-chamber C, having a bridge-wall, *c*, and a checker-work passage, D, at its rear end, which communicates through a flue, *d*, with the kiln. This checker-work passage consists of fire-bricks or other suitable material laid up with interstices, as shown, so that the heated gases and products of combustion passing through it are checked to the desired extent and too great heat prevented from entering the kiln.

Above the fire-chamber C is the chamber E, which communicates with said fire-chamber by a flue, *e*, and above the chamber E and separated therefrom by an arch is the main fire-chamber F, which communicates at its rear end

with the kiln through the flue *d*. Into the front of the lower chamber is inserted the oil-burner G, which is supplied with oil by the pipe *g*, said burner being of any ordinary pattern. Into the front of the upper fire-chamber is inserted an oil-burner, H, which is supplied with oil by the pipe *h*, controlled by a valve, *h'*.

I is a steam-pipe, one end of which may be supposed to connect with the boiler, whereby live steam is taken direct from the boiler. This pipe passes down in front of the upper fire-chamber, and is then carried into and around through the intermediate chamber, E, and out of said chamber, where it branches, the upper branch going to the oil-burner H above and the lower branch going to the oil-burner G below, these branches being controlled by cocks or valves J and J'.

The operation of the device is as follows: At the beginning of the operation in this class of furnaces it is necessary to have what is known as a "low fire." To obtain this, we use at first only the lower burner, G, in the lower fire-chamber, C. This burner being lighted, its flames and products of combustion, striking the bridge-wall, are separated, a portion passing up through the flue *e* into the intervening chamber, E, above and superheating the steam which is in the steam-pipe in said chamber. The steam thus superheated is supplied to the lower burner to assist its operation. The remaining portion of the flames and products of combustion, passing over the bridge-wall, proceeds to the rear end of the lower fire-chamber, and thence passes up through the checker-work D and the flue *d* into the kiln. When the necessity for a low fire has passed, the lower burner is shut off and the burner H of the upper fire-chamber is lighted, whereby the necessary high fire is obtained, and there is enough heat in the upper fire-place to keep up the heat through the intervening arch in the superheating-chamber E and keep the steam in the pipe in said chamber superheated, said steam being now supplied to the upper burner, the control of the steam being had through the valves described. It will thus be seen that this arrangement provides for the burners of both fire-chambers the necessary dry or superheated

steam for their operation, and at the same time by the arrangement of the fire-places provision is made for the low and high fire at different periods of the operation.

5 Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

10 1. In an oil-burning furnace, the combination of an upper and lower fire-chamber, the oil-burners therein, a separate chamber communicating with the lower fire-chamber, and a steam-pipe in said separate chamber connected with and supplying superheated steam to the oil-burner, substantially as herein described.

20 2. In an oil-burning furnace, the combination of the lower fire-chamber, the checker-work communication at its inner end with the kiln, the oil-burner in the front of the fire-chamber, the separate chamber above and communicating with the fire-chamber, and the steam-pipe within said separate chamber connected with the oil-burner, substantially as herein described.

25 3. In an oil-burning furnace, the combination of the lower fire-chamber, an oil-burner

therein, the upper fire-chamber and the oil-burner therein, the intervening separate chamber communicating with the lower fire-chamber, and the steam-pipe within said separate chamber and connected with the two burners, substantially as herein described.

4. In an oil-burning furnace having a shell inclosing the kiln, the combination of the lower fire-chamber of the shell and the upper fire-chamber, both communicating with the kiln, the separate oil-burners inserted in said fire-chambers, the separate chamber between the fire-chambers and communicating with the lower one, the steam-pipe from the boiler within the intervening chamber, and valve-controlled connections between said steam-pipe and the burners, substantially as herein described.

In witness whereof we have hereunto set our hands.

ALBERT V. CLARK.

ELIGHA THOMAS MAPEL.

Witnesses:

S. H. NOURSE,

J. H. BLOOD.