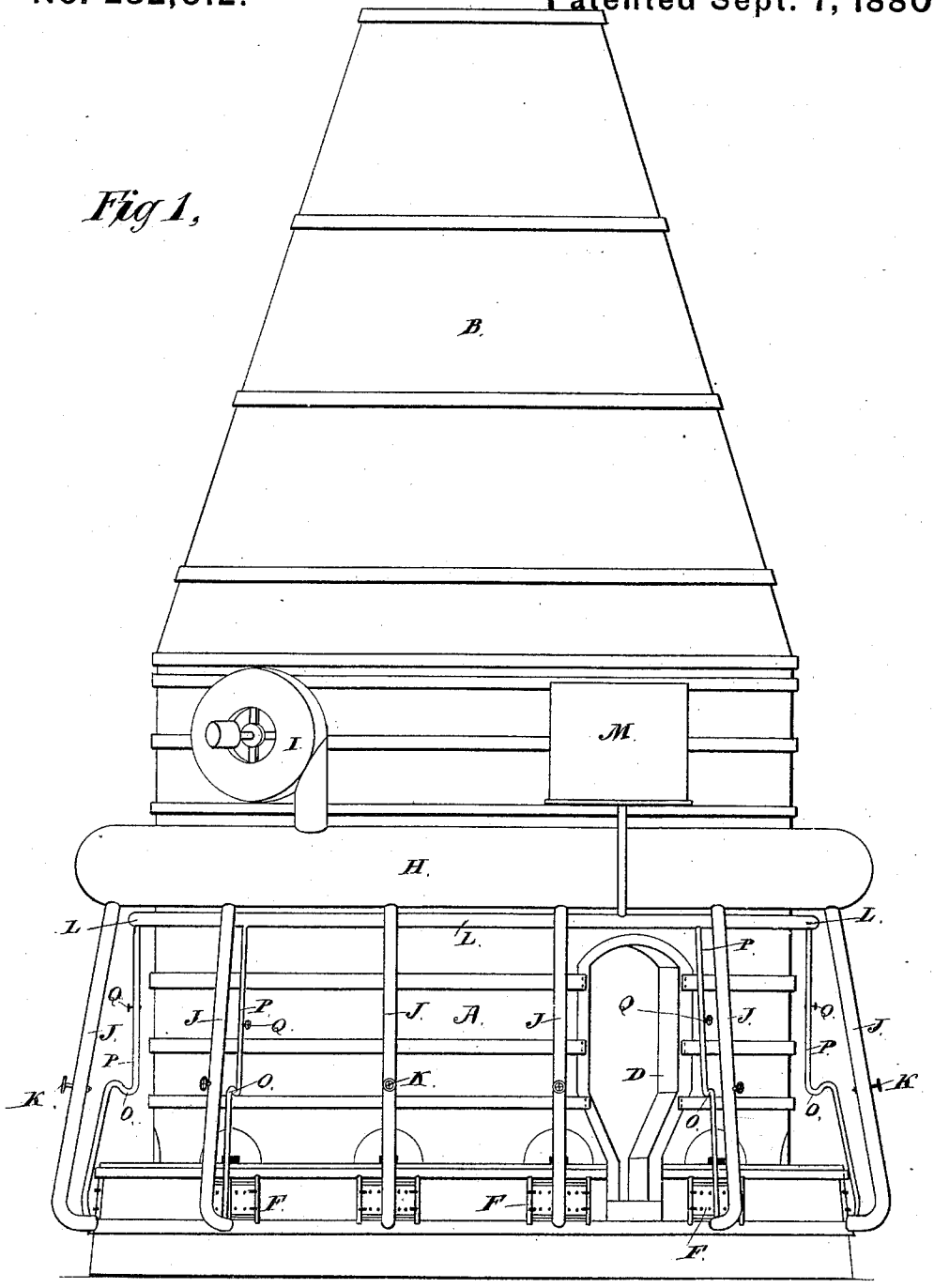
2 Sheets--Sheet 1.

G. DURYEE.

Pottery Furnace.

No. 232,012. Patented Sept. 7, 1880.

Fig 1,



Attest:
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By Knight Bros.
Attys

2 Sheets--Sheet 2.

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Pottery Furnace.

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Fig 2.

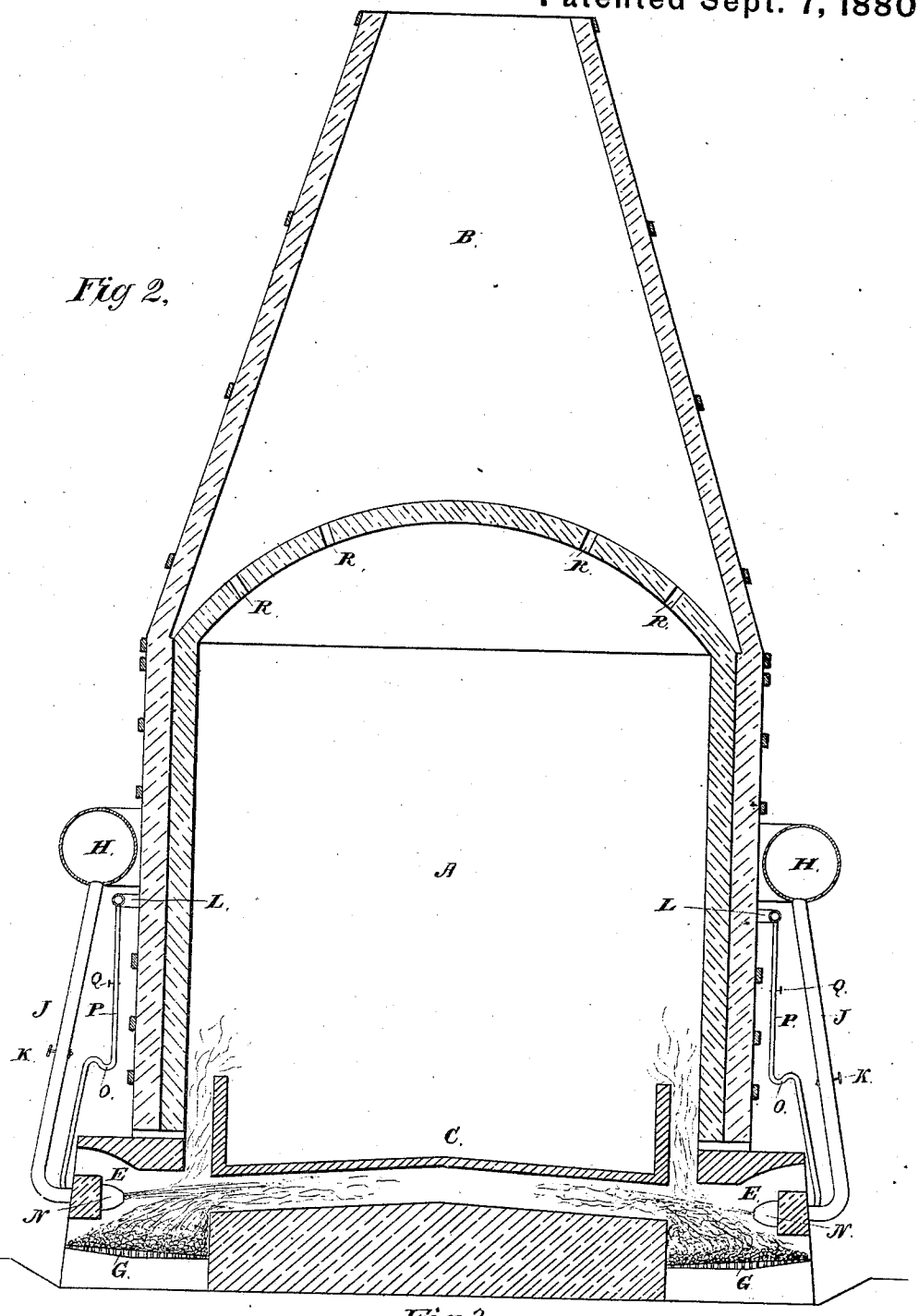
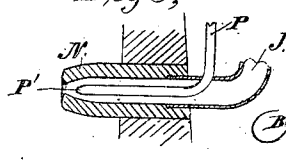


Fig 3.



Attest:
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UNITED STATES PATENT OFFICE.

GEORGE DURYEE, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF OF HIS RIGHT TO JOHN H. BREWER, OF TRENTON, NEW JERSEY.

POTTERY-FURNACE.

SPECIFICATION forming part of Letters Patent No. 232,012, dated September 7, 1880.

Application filed December 1, 1879.

To all whom it may concern:

Be it known that I, GEORGE DURYEE, M.D., of New York, in the county and State of New York, have invented a new and useful Improvement in Pottery-Furnaces, of which the following is a specification.

The subject of my invention is a device applicable to pottery-kilns, enameling-kilns, fret-kilns, and the like, also to kilns for burning tiles, fire-brick, and other wares.

It consists of an apparatus by which a combined blast of air and liquid fuel or gas can be applied in a jet through the flame of an ordinary fuel-furnace. These heating devices are arranged at suitable intervals around the oven, the air-blast and the liquid fuel or gas being each supplied through an annular pipe surrounding the oven. The blast-nozzle constitutes a retort within which inflammable gas is generated from the oil or other liquid fuel.

In order that my invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is an elevation of a pottery-furnace illustrating my invention. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a longitudinal section of the blast-nozzle on a larger scale.

A represents the oven; B, the stack; C, the hearth or receptacle for the wares to be burned or baked. D is a door of usual construction. E E E represent fire-places or fuel-furnaces; F, the furnace-door, and G the grates thereof.

H is an annular air-pipe surrounding the furnace and conducting the blast from a fan, I. J J J are pipes descending from the annular pipe H for conveying the blast to the nozzles N. The said pipes J are controlled by cocks K.

L is an annular pipe for conducting petroleum or other hydrocarbon or any suitable liquid fuel, which may be resin or other fusible matter in a liquid state, from a reservoir, M; or this may be simply a pipe conducting gas from a natural or artificial source of supply.

P P P are pipes for the liquid fuel, trapped as shown at O, and controlled by cocks or valves Q to regulate the flow.

The construction of the blast-nozzle N is more clearly shown in Fig. 3. It is formed of two concentric jet-pipes, the inner one formed of the horizontal termination P′ of the oil-pipe P, and the outer one of the horizontal end of the air-pipe J. The nozzle N is itself formed of fire-clay or surrounded with this or other suitable material. The nozzle thu constitutes a generating-burner, being exposed to the heat of the fuel in the furnace E.

The sides of the hearth or receptacle C, where the goods are placed for burning, are extended for a sufficient height to conduct the flame to the upper parts of the oven.

In operation, fire is made with any suitable fuel on the grates G, and the air-blast and oil-jet being turned on, a blow-pipe jet is introduced in every furnace in a horizontal direction, composed of a combination of atmospheric air and hydrocarbon vapor or gas, which, impinging upon the flame in the fuel-furnace E, drives a blow-pipe flame of intense heat inward beneath the hearth C. The said blow-pipe flames, being thus driven inward from every direction toward the center, unite beneath the hearth, and the heat is carried up in a very effective manner around the sides thereof, so as to thoroughly bake the wares in the upper part of the oven.

R R R represent outlets for the gases through the oven-roof.

As soon as the wares are thoroughly baked the fires are drawn, the flow of oil through the pipes P stopped, and the blast being continued, the furnace and its contents are cooled as rapidly as desirable, thus effecting a great saving of time required to work an entire charge and replace it with a new one. My invention thus constitutes a combined kiln for alternate use in baking and cooling the wares.

I am aware that it has been proposed to use a compound nozzle for the projection upon the flame of mingled streams of oil and steam. I am also aware that jets of air and oil have been combined; but I am not aware that such streams of liquid fuel have been so applied to the flame of a fuel-furnace as to produce a blow-pipe flame.

I am also aware that a stream of mingled air and oil has been introduced into a furnace, so as to be projected in the form of spray upon

limestone at a red heat. I am also aware that such streams of oil and air have been introduced so as to impinge upon and even to pass over the surface of the hearth; but I am not aware of any device where a furnace has been constructed so that the grate shall be at or near the bottom of the kiln, the flames from which furnace pass upward to the pottery-hearth and come in contact, when in line with such hearth, with a stream of mingled air and oil or gas projected against said ascending flames, so as to produce blow-pipe flames, which are blown upon and around the pottery-hearth, and thereby insure the rapid baking of articles thereupon.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a pottery or other kiln, a series or range of converging nozzles, N, surrounding the kiln horizontally, and consisting of two pipes—one for conducting liquid fuel or gas and the other for an air-blast—in combination with a fuel-furnace located below the level of the nozzles, so as to cause the blast therefrom to produce converging blow-pipe flames, and with a baking-hearth elevated to receive the blow-pipe flames beneath it, and constructed with vertical walls to distribute the heat upwardly and equalize the same throughout the oven.

2. The combination of the annular blast-pipe H, the annular oil-pipe L, descending pipes J P, the nozzles N, and furnace E below the level of said nozzles, with a crockery-oven or other kiln having the sides of the hearth extending upward for the purpose of conducting the flames to the upper part of the oven or kiln, substantially as set forth.

GEORGE DURYEE, M. D.

Witnesses:
H. E. KNIGHT,
OCTAVIUS KNIGHT.