

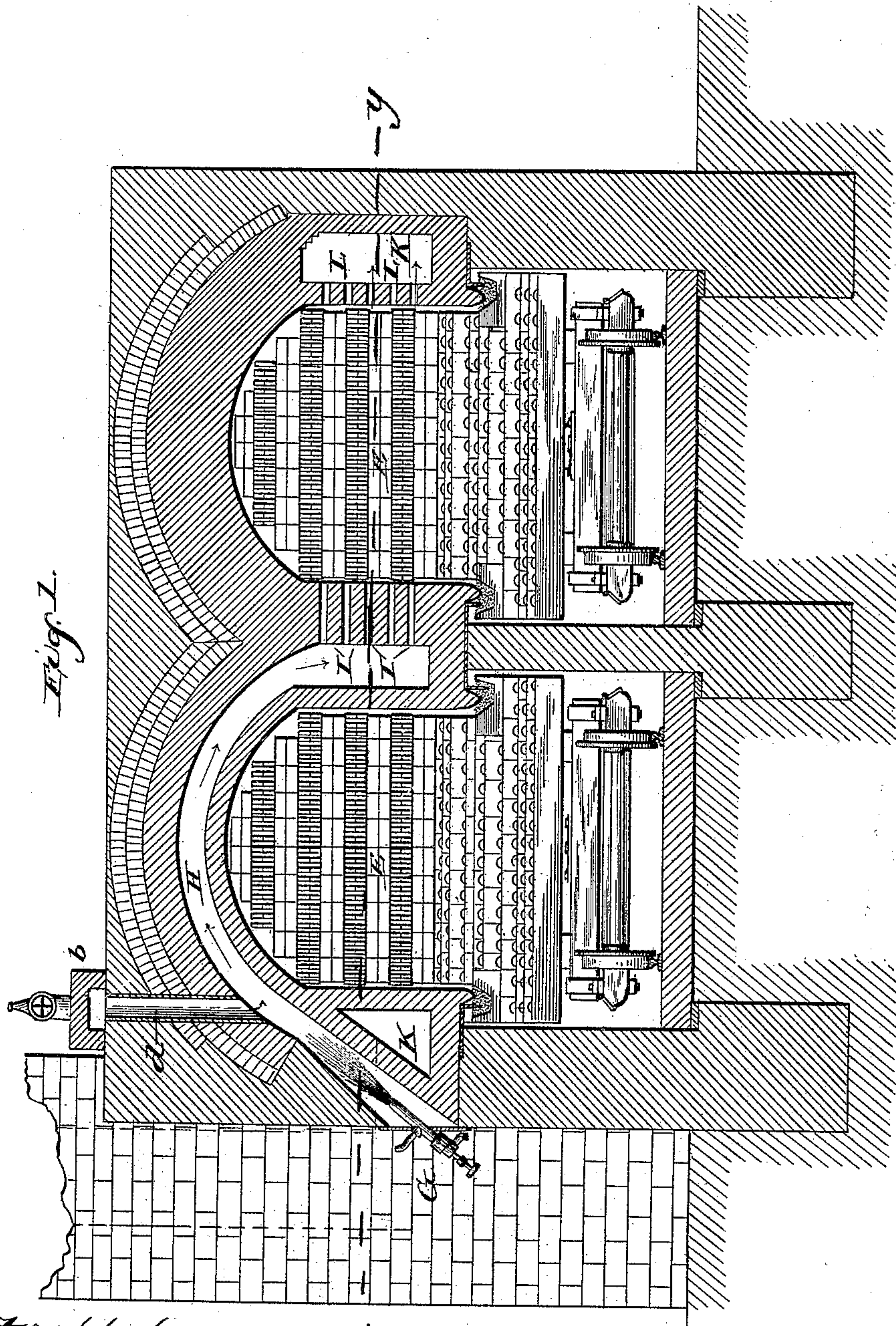
(No Model.)

2 Sheets—Sheet 1.

J. C. ANDERSON.  
METHOD OF BURNING BRICK.

No. 424,246.

Patented Mar. 25, 1890.



Witnesses  
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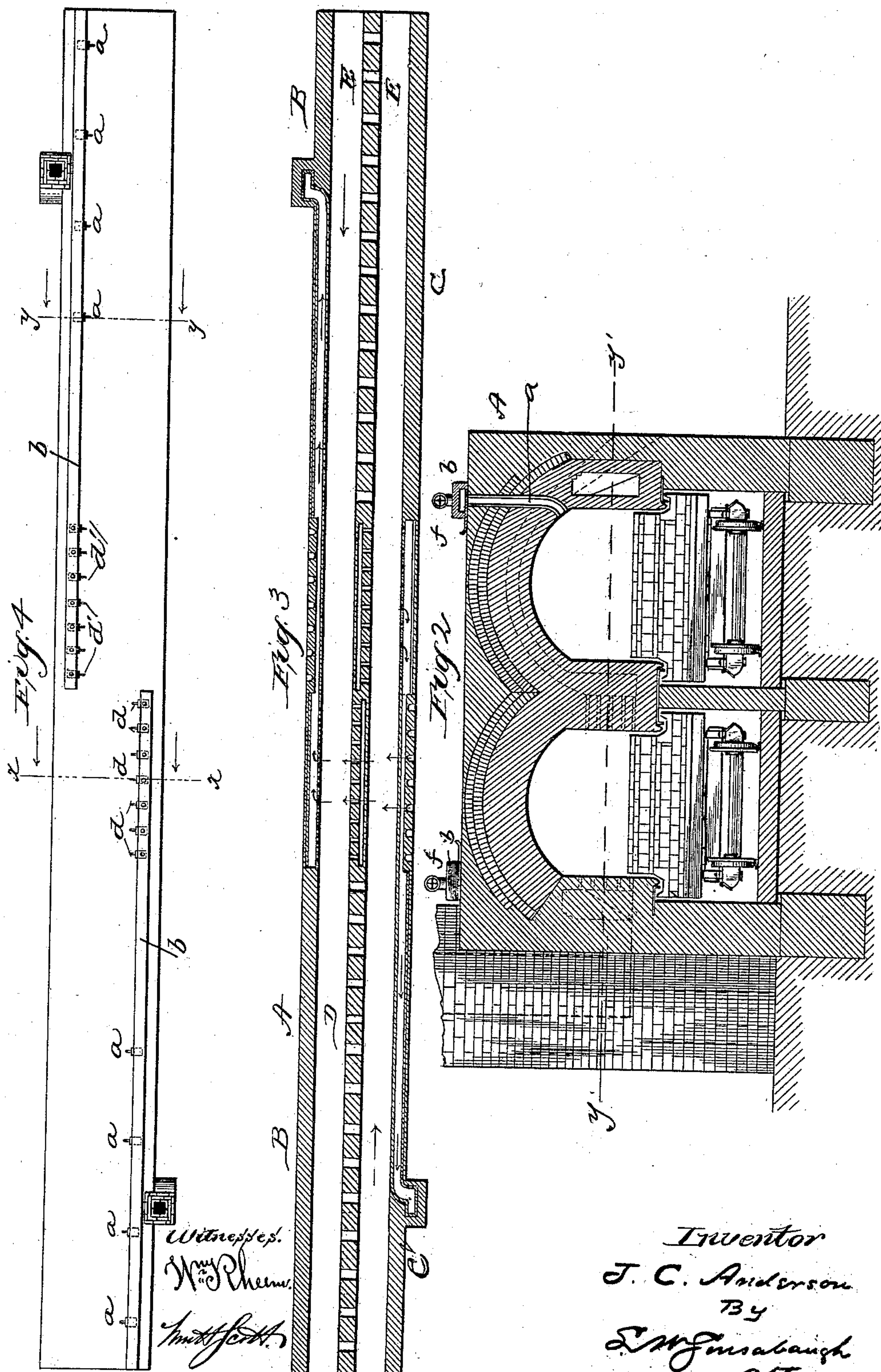
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# UNITED STATES PATENT OFFICE.

JAMES C. ANDERSON, OF HIGHLAND PARK, ILLINOIS.

## METHOD OF BURNING BRICK.

SPECIFICATION forming part of Letters Patent No. 424,246, dated March 25, 1890.

Application filed November 7, 1889. Serial No. 329,578. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES C. ANDERSON, a citizen of the United States, residing at Highland Park, in the county of Lake and State of Illinois, have invented new and useful Improvements in the Method of Burning Brick and other Clay Bodies with Oil as a Fuel; and I do hereby declare the following to be a full, clear, and exact description of said invention, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in the method of burning brick, tiles, and other clay bodies with oil as a fuel, the object of my invention being to provide means by which the oil is consumed and the heat properly distributed.

In burning bricks, tiles, and other clay bodies with oil as a fuel, as heretofore practiced, no effective means have been provided for properly distributing the heat. By the methods and devices in use, so far as I am aware, the oil is projected during the operation of burning much like a continuous stream of water thrown from a steam-engine, which is directed toward and onto the brick body to be burned. The impingement of the flame by this practice causes the bricks against which the oil is projected to become melted, warped, and distorted, resulting in the displacement of the piling of the brick; and, furthermore, if the force of the flame is allowed to come in contact with the brick close to the burner the heat is too intense and circumscribed. In order to overcome this, the burners or devices for feeding the oil to the combustion-chamber are passed through the wall of the outer arch of the kiln, so as to cause the flame to be first directed around the inner arch in a curved line, so as to break the force of the oil-jet, and spreading it so that the hottest part of the flame will be given off in that portion of the tunnel between the arches, thus heating them and delivering the heat after it has been robbed of its destructive force to direct contact with the brick piled in the car in the opposite tunnel.

Referring to the drawings, Figure 1 is a

transverse vertical sectional view taken on the line X X of Fig. 4. Fig. 2 is a similar view taken on the line Y' Y' of Fig. 4. Fig. 3 is a horizontal sectional view taken on the line Y Y of Fig. 1. Fig. 4 is a top or plan view.

The double-tunneled kiln shown in the drawings, except the furnaces and flues for the escape of the waste products of combustion, is essentially the same as the kiln for which Letters Patent were granted to me March 6, 1888, No. 379,041.

A indicates the kiln, which is composed of two parallel walls B and C and a central or partition wall D, dividing the kiln into two longitudinal chambers or tunnels E, each covered by separate arches, which rest upon and are supported by the partition-wall D and the outer walls B and C. G are the devices for feeding the oil to the jacketed space between the arches, and consists of any desired number of nozzles, which penetrate the outer walls of both tunnels at or near the center of the kiln. That portion of each tunnel adjacent to the oil-supply nozzles is double-walled, so as to form a jacketed space or flue H, leading from the oil-burners over the top and down one side of the tunnel, as shown in Fig. 1, where it passes through numerous perforations I into the adjacent tunnel, exposing the brick on the car in this portion of the kiln to the direct action of the regeneration-flame, while the brick on the car adjacent the oil-burners receives the heat transmitted through the arch or lining of the tunnel. The oil entering the jacketed space of the tunnel is directed around the arch, causing it to be forced in in a curved line, so as to break the force of the oil-jet, and causing it to be scattered and spread, so as to give off the hottest part of the flame to that portion of the tunnel between the arches, heating the same and delivering the heat after it has been robbed of its destructive forces to direct contact with the brick piled on the car in the opposite tunnel, and in this manner none of the brick are subjected to direct contact with the oil, or subjected to the destructive heat, or in any way injured or marred by the tar or residuum of the oil. The products of combustion after



passing through the bricks on the cars in the opposite tunnel enter a flue K through perforations L, and then along said flue in front of the oil-burners in the adjacent tunnel to its respective stack. The products of combustion in passing through the flue K heat up the outside wall of this portion of the tunnel, which imparts its heat to the sides of the brick on the loaded car farthest from the outgoing hot brick and preventing the destructive influence of the flame incident to this kind of fuel, and thus equalizes the drying and heating process, and prevents the bricks from becoming warped or checked.

Thus far I have described the operation of one system of oil jets or burners; but the same operation takes place in the burners in the other tunnel, its action serving to burn the brick in the adjacent tunnel, and the waste products of combustion being utilized in like manner to heat the entrance end of the adjacent tunnel to water-smoke the bricks.

The central or partition wall D, from the oil-burners G to each end of the kiln, are provided with numerous openings O, which virtually make these portions of the kiln one chamber and through which the heat given off of the burned brick is transmitted to the adjacent tunnel to raise the temperature of the brick in this portion of the tunnel to a red heat before they are pushed forward to receive the more intense heat direct from the opposite arch or which may be transmitted through their respective arches.

In giving a more complete description of the operation of the kiln I will state that the cars containing the green or newly-made brick are admitted to the tunnels from opposite ends of the kiln two at a time, one at each end, and are moved in the direction of the arrows, as shown in Fig. 3, and that the heat from the burned brick on the outgoing cars in one tunnel after they pass the oil-burners is utilized to water-smoke and heat to a red heat the bricks on the cars in the adjacent tunnel.

It will be understood that the water-smoke generated in the initial burning is raised at or near the ends of the tunnels at a low heat, even below the boiling-point of water, and that a constant heat is maintained which is above the decomposing-point of water in the

fire-space of the arches, and that in order to utilize the water-smoke as a fuel, in the shape of a hydrogen gas, I make openings or ducts *a* through the tops of the tunnels at the entrance ends, which convey the water-smoke into the horizontal flues *b*, located on top of the tunnels, through which the water smoke is carried forward and injected through a series of pipes *d* into the jacketed space H and directly in front of the oil-burners G, where it meets with the oil, so that in the water-smoking the water becomes vaporized and a cloud of vapor is drawn forward by the draught of the stack into and through the jacketed or flue space and burned in the proper proportions and at the proper temperature to be decomposed and burned as hydrogen gas.

The flues *b* are provided with valve-regulated tubes *f* for the admission of the proper amount of atmospheric air to effect a complete combustion of the hydrocarbon and hydrogen gas formed by the union of the oil and water-smoke.

What I claim is—

1. The method herein described of burning brick with oil or other hydrocarbons, which consists in first spraying and igniting the oil in and through elongated tuyeres, the force of the flame being directed in the same line or by easy curves, so as to prevent the impingement of the destructive part of the hydrocarbon flame against the kiln walls or body to be burned, and, second, after the force of the flame is expended, passing the heated products of combustion directly through the bodies to be burned, as set forth.

2. The method herein described of burning bricks, tiles, and other clay bodies with coal-oil or other hydrocarbons, which consists in spraying the oil and burning it, together with the hydrogen of the water-smoke and oxygen of the air, in a jacketed space which partially surrounds the bodies to be burned, as set forth.

In testimony whereof I affix my signature in the presence of two subscribing witnesses.

J. C. ANDERSON.

Witnesses:

C. L. BEATTY,  
J. F. ANDERSON.