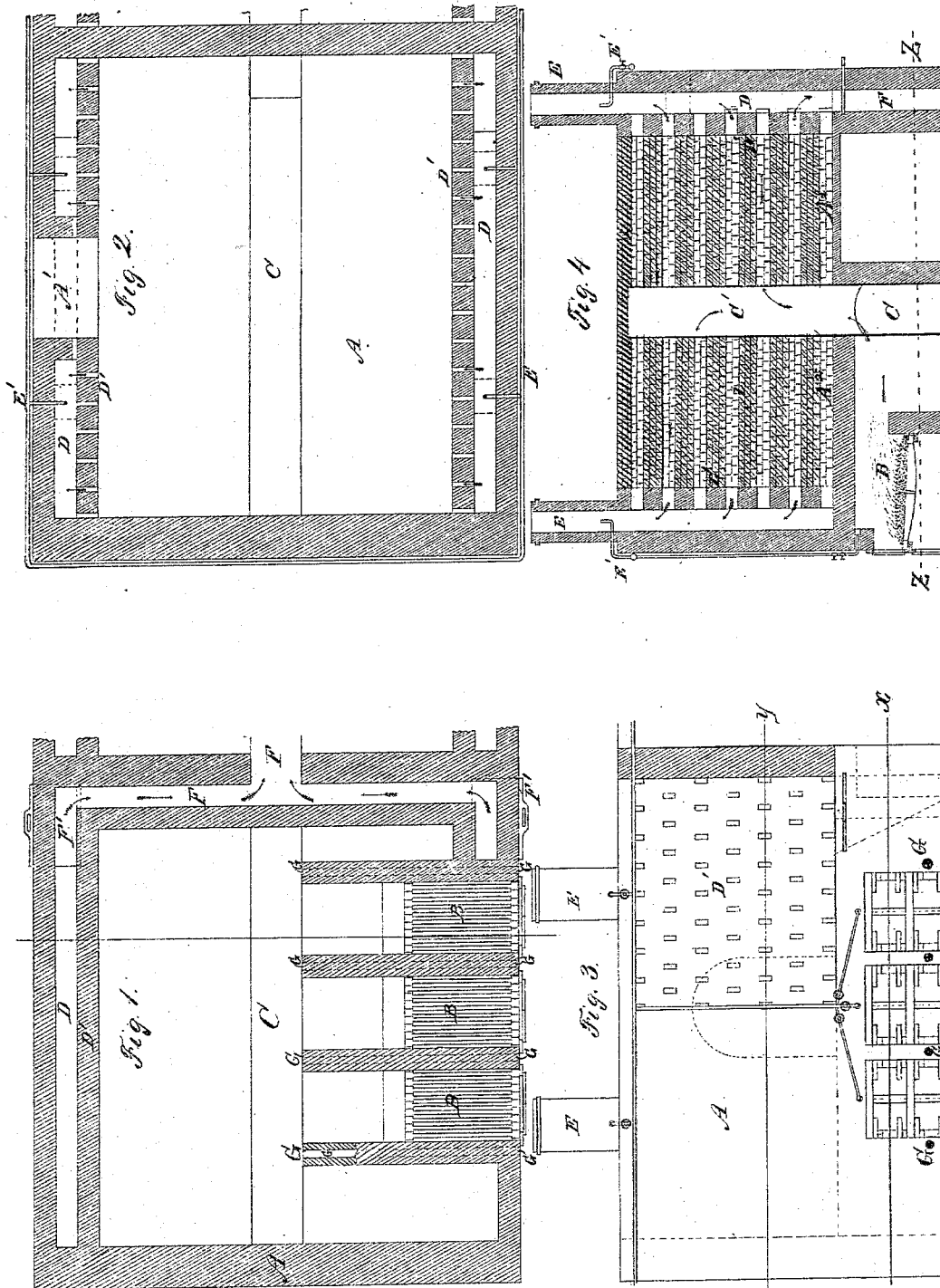


BENJAMIN WALLIS.

Improvement in Brick Kilns.

No. 115,793.

Patented June 6, 1871.



Witnesses
A. Ruppert.
C. H. Clausen

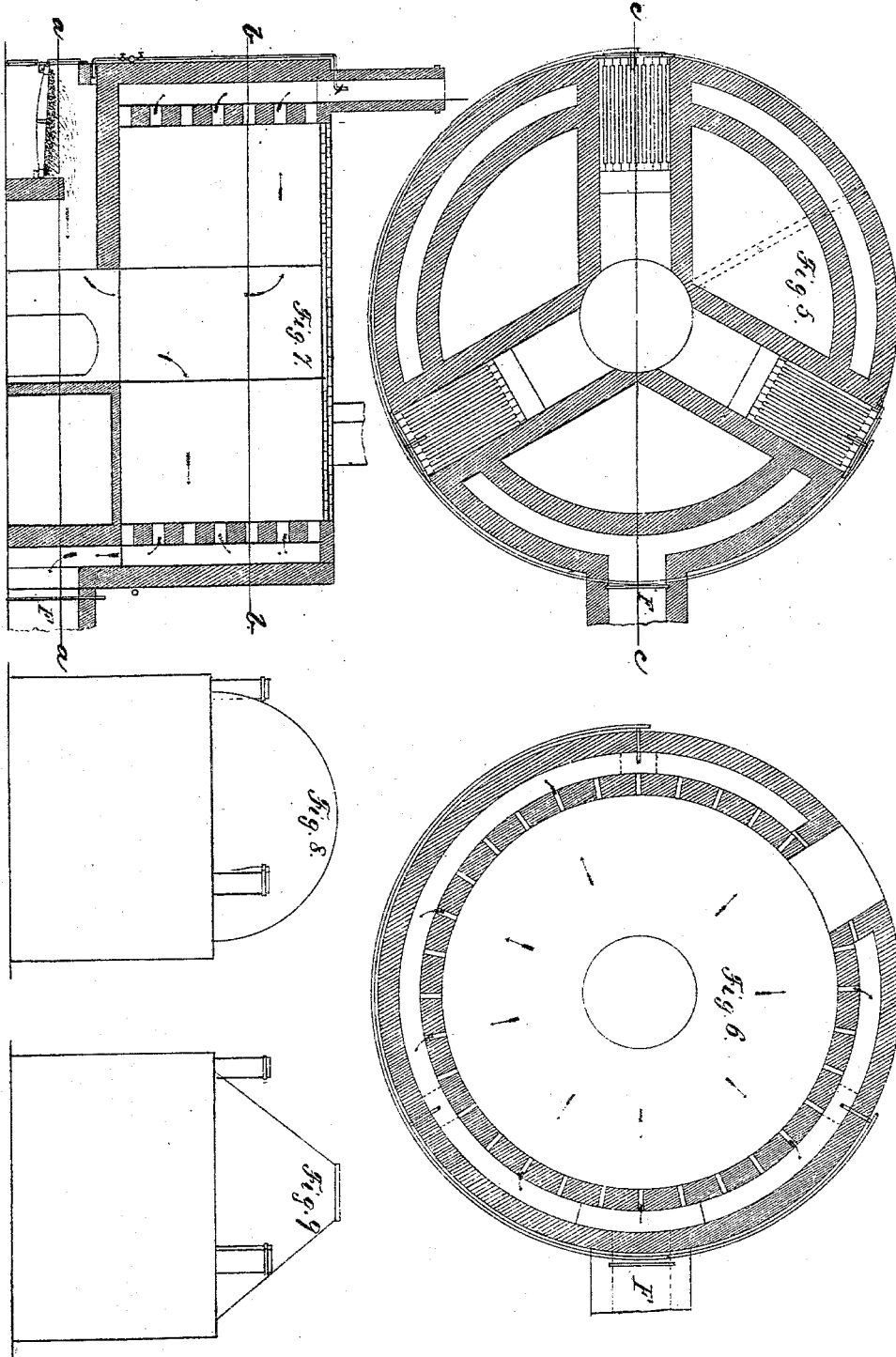
B. Wallis
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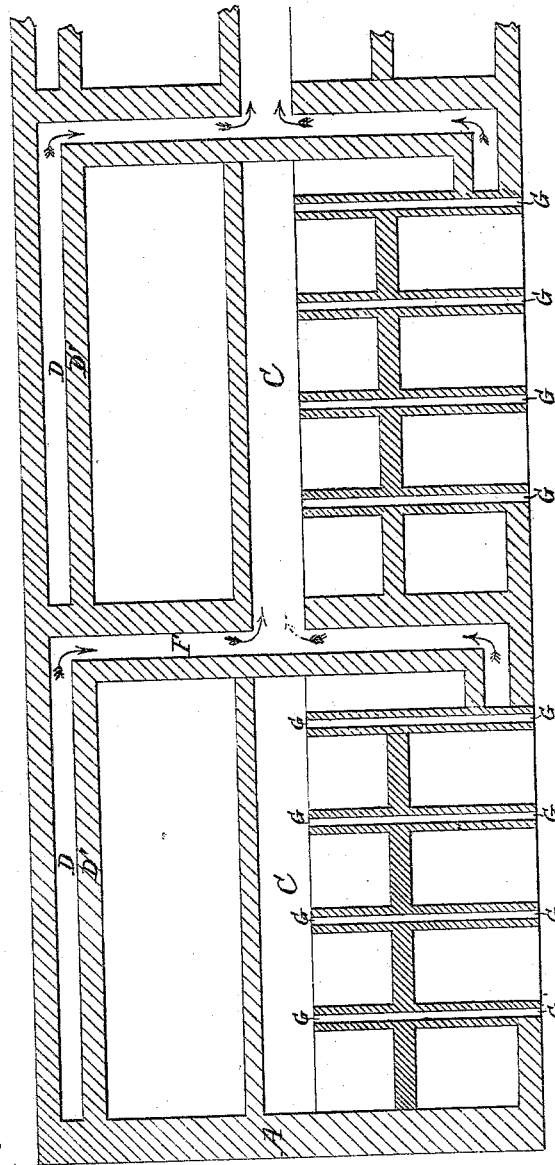
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Fig. 10



Attest

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UNITED STATES PATENT OFFICE.

BENJAMIN WALLIS, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN BRICK-KILNS.

Specification forming part of Letters Patent No. 115,793, dated June 6, 1871.

To all whom it may concern:

Be it known that I, BENJAMIN WALLIS, of Baltimore, in the county of Baltimore and State of Maryland, have invented certain Improvements in Brick-Kilns; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the annexed drawing making part of this specification, in which—

Figure 1 is a horizontal section of one of the compartments of a continuous kiln taken on the line *x x* of Fig. 3. Fig. 2 is another horizontal section thereof on line *y y* of Fig. 3. Fig. 3 is a front elevation of such a compartment partly in section. Fig. 4 is a vertical transverse section thereof. Fig. 5 is a horizontal section on line *a a* of Fig. 7, showing a compartment of circular form. Fig. 6 is another horizontal section on line *b b* of Fig. 7. Fig. 7 is a vertical transverse section on line *c c* of Fig. 5. Figs. 8 and 9 are elevations of a circular compartment covered by a dome or truncated cone-shaped roof. Fig. 10 is a horizontal section, showing two compartments of a continuous or serial kiln, and the arrangement of the connecting-flues.

The same letters are used in all the figures to designate identical parts.

This invention relates to that class of brick-kilns known as continuous kilns, and composed of a consecutive series of compartments, divided from each other by permanent walls, but in communication one with the other by flues controlled by dampers; and in which the furnaces of the different compartments are fired successively to keep the burning process up uninterruptedly. My improvements consist in the details of construction and arrangement of such a kiln, as will be more specifically pointed out in the subjoined description and claim.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

Where the kiln is of a rectangular form the space inclosed by the inner and outer walls is divided, by permanent partition-walls, into the required number of compartments A, each one of a size sufficient to receive from ten to thirty thousand brick, more or less. Each compartment is provided on one side with a door or passage way, A¹, for charging and dis-

charging it. The floor A² is elevated above ground so as to admit of the furnaces B being built under the same, for the purpose of a more equable distribution of the heat through the mass of green bricks. The heated gases and products of combustion pass from the furnaces under the floor of the compartment to a trench or flue, C, dividing it longitudinally into two equal parts, as clearly shown in Figs. 1, 2, and 4. This flue is uncovered or open on top. The green bricks are stacked, in the usual manner, on the floor of the compartment on either side of this flue C, so as to leave a space between the piles of the width of the flue from the bottom to the top, and from end to end of the compartment, forming a chamber, C', for the collection of the heated gases and products of combustion coming from the furnaces. After a compartment has been charged with green bricks its top is closed air-tight, in the usual manner, by two or more layers of brick resting upon the top of those to be burned. A vertical flue, D, is formed on each side of the compartment, opposite to the central flue and chamber C C', by the exterior walls and interior pigeon-holed walls D'. These flues extend the entire length of the compartment, and from the floor to the top of the same, communicating with the chimneys or up-takes E, of which there may be four to each compartment, two for each flue D, as shown. Steam-pipes E', with jets directed into the furnaces and upward into the up-takes, are used to increase the draft while driving off the water-smoke from the green bricks. The heated gases and products of combustion passing from the furnaces into the flue C are collected in the hot-air chamber C', from which they are drawn and distributed through the interstitial spaces of the masses of brick on either side, and escape, ultimately, through the pigeon-holed walls D', into the flues D and out of the chimneys E. As soon as the water-smoke has been drawn off from the bricks in the first compartment the steam-jets in the up-takes are turned off and the latter closed on top by dampers for that purpose, but the fires are kept up to burn the brick. The surplus heat from the first compartment passes through a flue, F, arranged along the partition-walls, and communicating with the vertical flues D, into the flue C of the next com-

partment, as best seen in Fig. 10, to be utilized in driving off the water-smoke of the green bricks therein and assist in burning them. This connecting-flue F is divided or separated from the flue C of the first compartment by a wall, as shown, and is provided with dampers F' F' to shut off communication with the vertical flues D D when necessary. To ignite the heated gases in the chamber between the piles of bricks, I provide them with the required amount of oxygen by passing atmospheric air, either by a natural or forced draft, into such chamber through a series of passages, G G, which may be formed in the walls dividing the furnaces, so as to heat the air in its passage to the chamber and cause it to be in a better condition to unite with the heated gases therein. Simultaneously with opening the dampers F' F' to allow the surplus heat from the first compartment to pass into the second, the fires in the latter are kindled, and the above process is repeated here, and so on through all the remaining compartments.

In a continuous kiln the number of compartments is such that by the time the water-smoke is off from the bricks in the last compartment of the series the bricks in the first have been burned, cooled, and removed, and the compartment recharged with green bricks, so that the surplus heat from the last compartment may be utilized in driving off the water-smoke from the green bricks in the first one.

In the circular form of compartments I prefer to arrange the furnaces radially, in the manner shown in Fig. 5, with the hot-air-chamber in the center, from which the collected heated gases pass in all directions through the mass of green bricks surrounding it into the circular flue inclosed by the outer wall and pigeon-holed inner wall, as in the rectangular com-

partment this latter flue is connected with the central flue of the next compartment by means of the flue indicated by the letter F in Figs. 5, 6, and 7, which flue is controlled by a damper so as to open or shut off communication, at pleasure.

It is apparent that any of the compartments is a complete kiln in itself, and may be burned off independently of the remaining compartments.

Where the kiln is to be worked at all seasons of the year a permanent shed may be built over it; or it may be inclosed by an outer building with the chimneys projecting through the roof of the latter.

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

1. In combination with the furnaces B, floor A², and pigeon-holed walls D' belonging to the permanent structure of the kiln, a chamber, C', extending to the cover of the kiln, as shown in Fig. 4, formed in piling the green bricks, and openings through said green bricks for conducting the draft horizontally from the chamber C' through said openings into the flues, substantially as set forth.

2. The air-passages G, in combination with the hot-air chamber C C', substantially as and for the purpose set forth.

3. In a series of compartments or kilns, A, the flue F, in combination with the flues D of one kiln and the flue and hot-air chamber C C' of the next, said connecting-flue F being controlled by suitable dampers, and arranged substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

BENJN. WALLIS.

Witnesses:

A. RUPPERT,

B. EDW. J. EILS.