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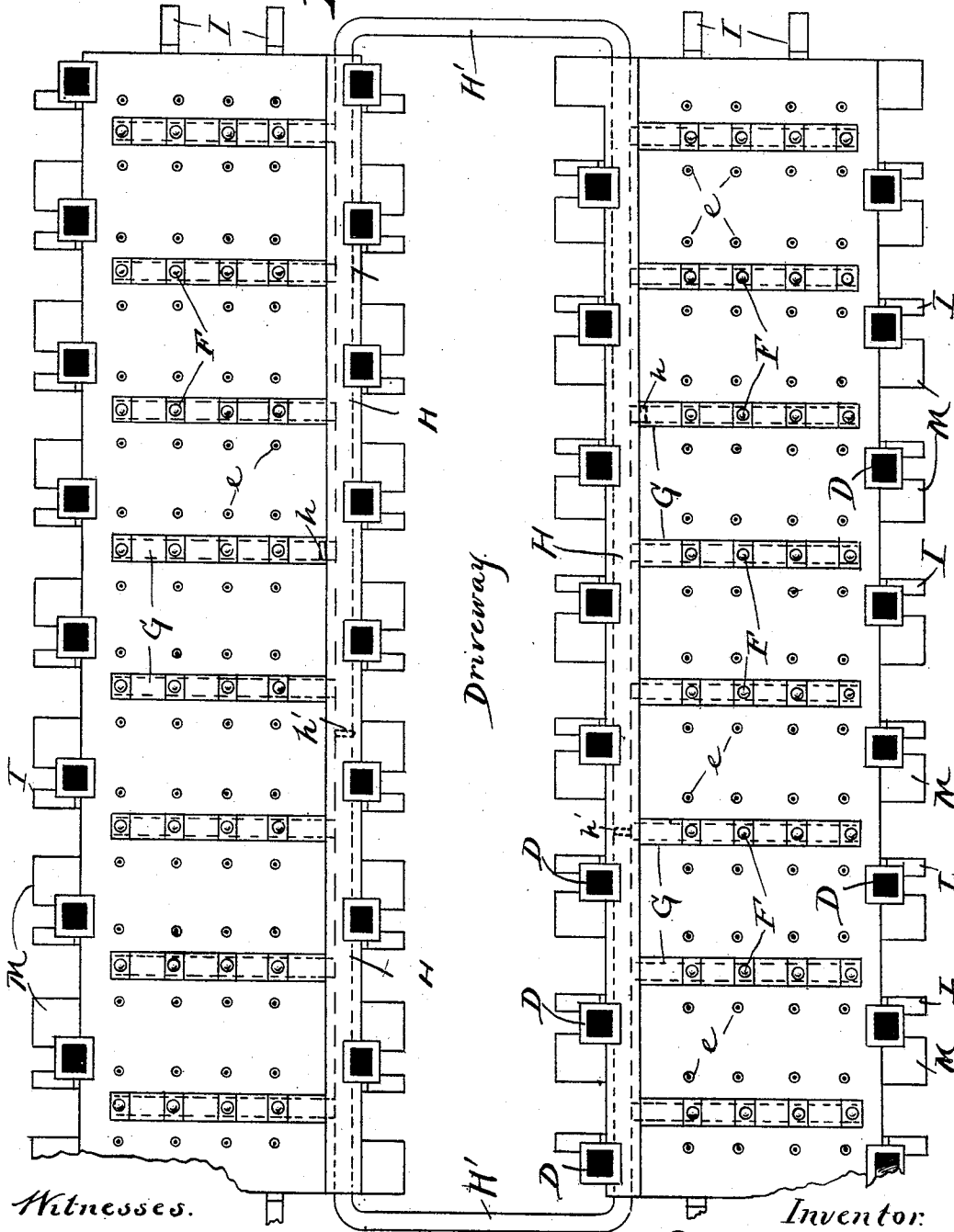
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J. W. PENFIELD.
BRICK KILN.

No. 480,936.

Patented Aug. 16, 1892.

Fig. 1.



Witnesses.

E. B. Gilchrist
[Signature]

Inventor:

James W. Penfield
[Signature]
By *[Signature]*
Attorney

(No Model.)

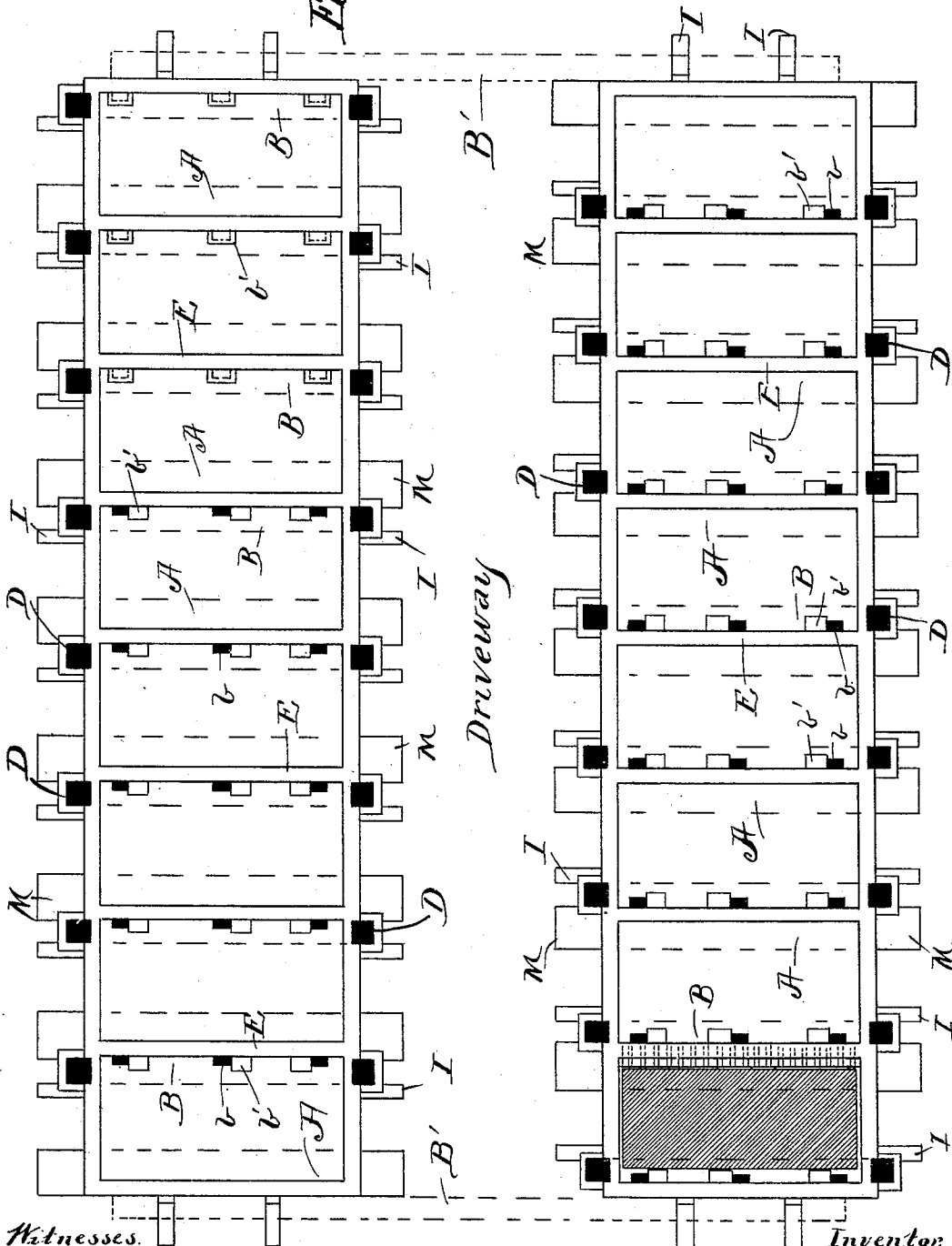
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Fig. 2.



Witnesses.

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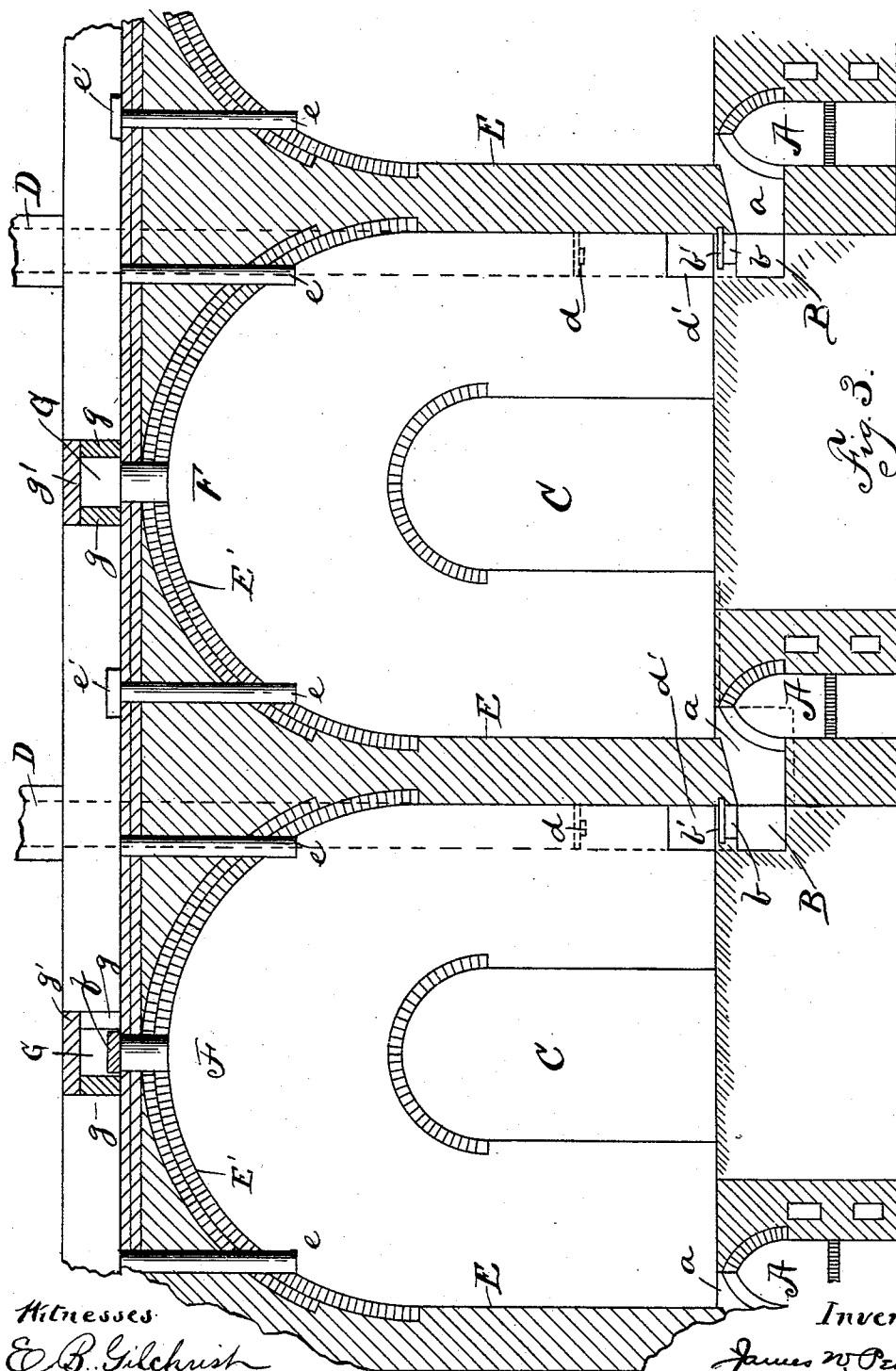
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UNITED STATES PATENT OFFICE.

JAMES W. PENFIELD, OF WILLOUGHBY, OHIO.

BRICK-KILN.

SPECIFICATION forming part of Letters Patent No. 480,936, dated August 16, 1892.

Application filed August 18, 1891. Serial No. 403,034. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. PENFIELD, of Willoughby, in the county of Lake and State of Ohio, have invented certain new and useful Improvements in Brick-Kilns; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in brick-kilns; and it consists in certain features of construction and in combination of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan of the roof of a continuous series of brick-kilns embodying my invention. Fig. 2 is a plan taken at the floor-line. Fig. 3 is an enlarged elevation in longitudinal section.

In carrying out my invention a suitable plat of ground is leveled off and divided by a driveway into two equal rectangular sections. (See Figs. 1 and 2.) Each kiln-section is inclosed by a suitable wall and is divided by cross-walls into a series of compartments supposed to be of equal dimensions the one with the other. Under the floor of each compartment and close to the one side thereof is built a furnace A, and by the side of such furnace and parallel therewith is built a flue B, this flue being constructed under the next compartment. The arch or roof of a furnace on the side farthest from the flue is composed of solid brickwork, while the arch or roof of such furnace next the flue is built in piers or sections usually the length of a brick, and between such piers or sections are spaces *a*, about four inches wide, alternating with the piers. Spaces *a* extend up through the floor of the compartment above the furnace and also extend laterally and open into the adjacent flue B, from whence lead vertical openings *b*, and discharging into the compartment above the flue. Openings *b* are provided with dampers *b'* for closing or partially closing the same, as the case may be, these dampers being usually flat tiles. Flues B at their ends connect with chimneys D, these chimneys having dampers; as at *d*, for closing the same. Also openings *d'* lead from each compartment into the opposite chimneys, and these openings are closed by dampers. (Not shown.) These

chimneys are used principally in starting the fire in the furnaces, and after the furnaces are well under way the dampers of these chimneys are closed and may be opened again in the cooling-down process. With the construction shown the products of combustion may pass into the compartment above a furnace, and if dampers *b'* of the co-operating flue B be open the products of combustion may also pass from the furnace through opening *a* into the adjacent flue B, and from thence may pass into the compartment above such flue. Also, if the furnace-doors be closed the hot air from one compartment may pass from thence down through openings *a* into flue B, and from thence may pass through opening *b* into the next adjacent compartment, whereby the surplus heat from one compartment where the bricks have been burned or nearly so, may be passed into the next adjacent compartment and utilized in drying or partially burning the bricks in such adjacent compartment.

C represents the doorways in the side walls through which access is had to the different compartments.

I are merely buttresses for bracing the outside walls

M M are trenches located in front of each furnace, where the operator stands in firing.

E E are the partition-walls, with arches *E'* for supporting the roof, the arches of course constituting a part of the roof. There are a number of small openings *e* leading from each compartment up through the roof, these being constructed, preferably, by setting hollow tiles in the roof and arch when these are being constructed, openings *e* being covered each by a tile *e'*, laid on top of the roof. These tiles *e'* are removed during the "steaming-out" or drying stage and afterward replaced while the bricks are being burned. There are also a row of larger openings F constructed in a similar manner and provided with flat tiles *f*, respectively, for covering these openings. Openings F are arranged in a row cross-wise the kiln and at the center of each compartment, and each row of openings F discharge into a cross-flue G built on top the roof. The side walls *g* of a flue G are usually constructed of a single layer of brick and the flue is covered with flat tiles *g'*, and the walls and tiles are usually daubed with mud

to render the joints approximately air-tight. A tile *g'*, that is next above a tile *f*, may at any time be removed to give access to the latter in removing or replacing such tile *f* from or over an opening *F*. Each flue *G* discharges into a longitudinal flue *H*. Flat tiles may be set edgewise and crosswise at the mouth of any flue *G*, as at *h*, to close communication with such flue and flue *H*, and other tiles in like manner may be set in flue *H*, as at *h'*. The ends of the two flues *H* are connected by pipes *H' H'*, so that the system of flues on the roof are connected into an endless series, and the furnace and flues *B* are connected to form an endless series by means of underground flues *B'*. With such construction, when the bricks in a compartment have been burned or the burning process has progressed so far that there is more heat than is wanted in such compartment, such surplus heat may be transmitted through openings *a* to the next adjacent compartment, and, if it is desired, from thence onto another compartment, and so on. Also, by means of the system of flues on the roof the hot air from one compartment may be transmitted to any advanced compartment in the series. Hence when a fire is made in a furnace the bricks in the compartments adjacent such furnace will likely have been dried and partly burned by means of heat transmitted from other compartments. It will therefore be readily understood that but little fire is necessary in the successive furnaces, from the fact that the bricks in the compartments next adjacent such furnace will only need a little extra heat to complete the burning.

I may add that the chimneys *D* need only extend to or a trifle above the roof, and these are usually built in connection with the side walls and involve but little extra expense.

That portion of the present invention relating to the construction and arrangement of the furnaces, the furnace-flues, and intimately-

connected parts is shown and described in this specification simply to give a clear understanding of the invention; but I make no claim to these parts herein, because they are disclosed in a separate application, Serial No. 403,032, concurrently pending; but

What I claim is—

1. A brick-kiln comprising two opposing series of compartments and corresponding series of furnaces and co-operating flues arranged substantially as indicated, whereby communication may be had between next adjacent compartments by means of a furnace and flue, a cross-flue located on the roof of the kiln above each compartment, such cross-flues discharging in common into a longitudinal flue, and means, substantially as shown, for opening and closing communication between each cross-flue and the compartment below it and between each cross-flue and the longitudinal flue, substantially as set forth.

2. A brick kiln comprising two opposing series of compartments with furnaces and flues below the floor furnishing communication from one compartment to another, substantially as indicated, and a series of cross-flues and a longitudinal flue located on the roof of each section of the kiln and arranged substantially as indicated, whereby communication may be had between different compartments of the same section, the two series of furnaces and flues below the floor being connected at their extremes to form an endless series and the two series of flues on the roofs being connected at their extremes to constitute an endless series, substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 25th day of July, 1891.

JAMES W. PENFIELD.

Witnesses:

C. H. DORER,
WARD HOOVER.