

(No Model.)

L. F. & B. C. WICKERS.

TILE KILN.

No. 335,665.

Patented Feb. 9, 1886.

Fig. 1.

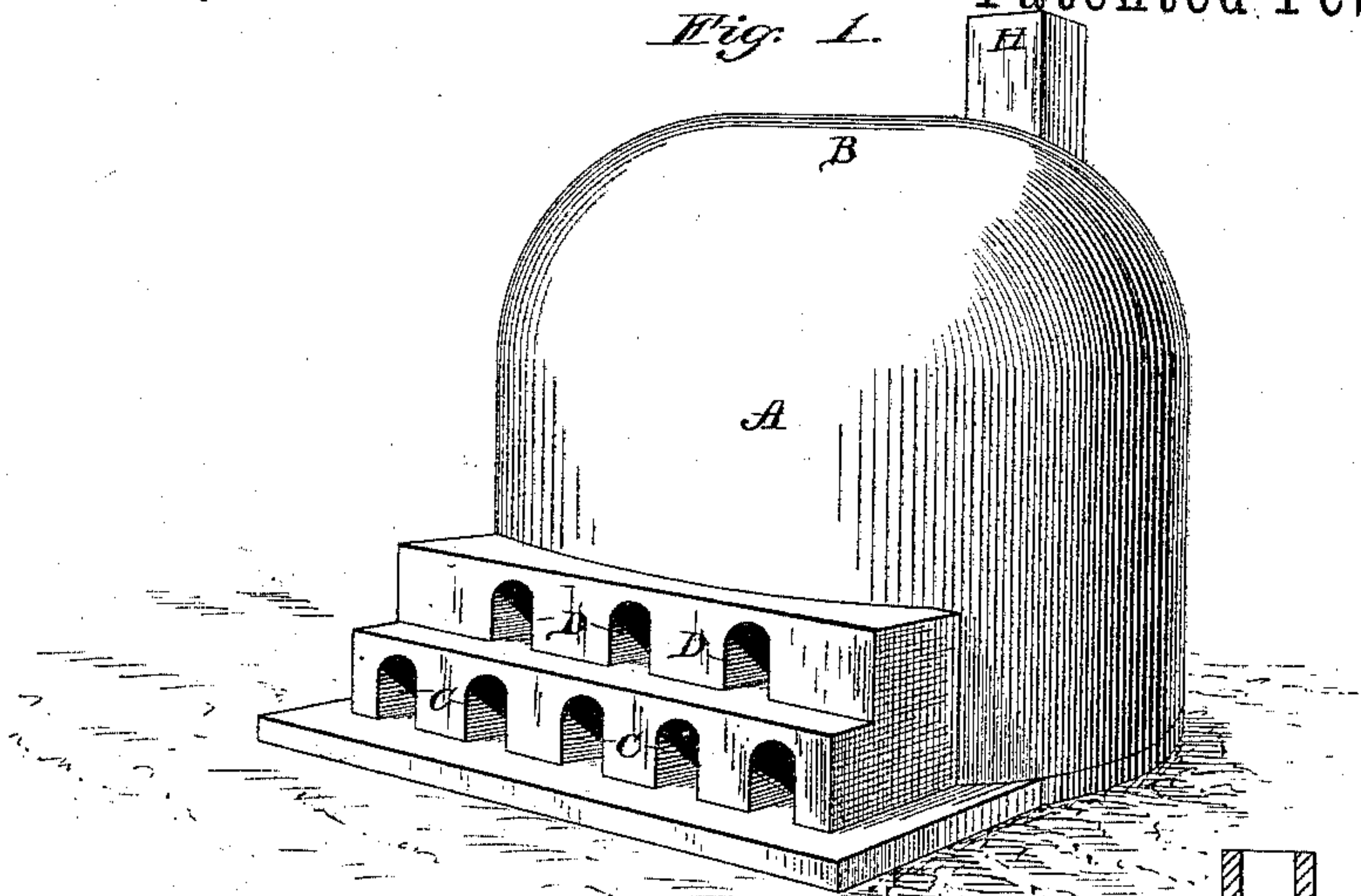
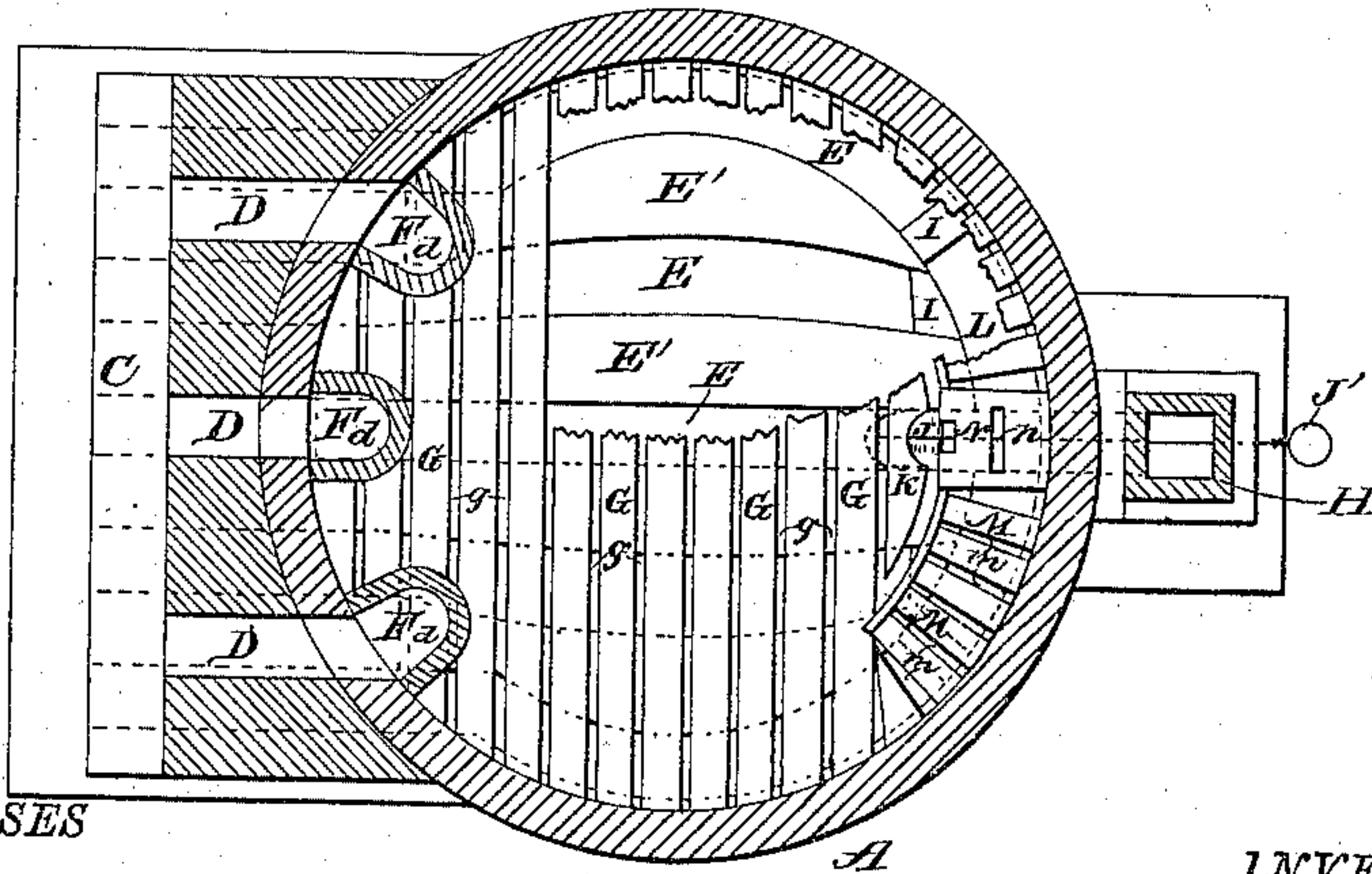
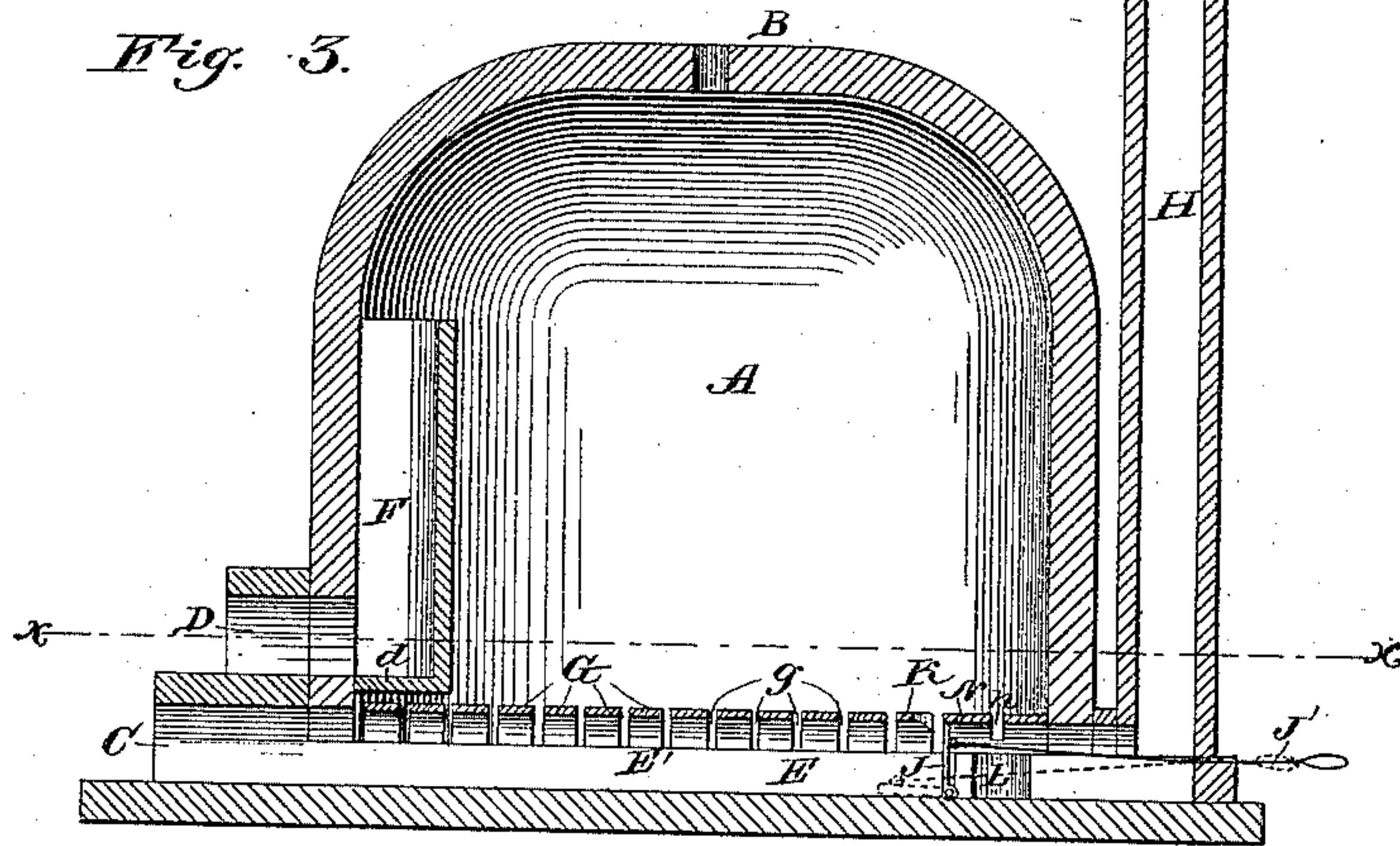


Fig. 3.



WITNESSES

Percy C. Bowen.
H. J. Beruhart

Fig. 2.

INVENTOR
Lewis W. Wickers &
Barney C. Wickers.
By C. A. Snow & Co.
their Attorneys.

UNITED STATES PATENT OFFICE.

LEWIS F. WICKERS AND BARNEY C. WICKERS, OF LEBANON, INDIANA.

TILE-KILN.

SPECIFICATION forming part of Letters Patent No. 335,665, dated February 9, 1886.

Application filed September 12, 1885. Serial No. 176,919. (No model.)

To all whom it may concern:

Be it known that we, LEWIS F. WICKERS and BARNEY C. WICKERS, citizens of the United States, residing at Lebanon, in the county of Boone and State of Indiana, have invented a new and useful Improvement in Tile-Kilns, of which the following is a specification, reference being had to the accompanying drawings.

Our invention has relation to improvements upon the tile-kiln patented to us on the 13th day of July, 1880, and numbered 229,848; and the novelty consists in the construction, combination, and arrangement of the various parts for service, substantially as hereinafter fully set forth, and particularly pointed out in the claims.

Our invention has for its object to provide a kiln which is especially adapted for burning tile, and which shall rapidly and economically accomplish the burning thereof, which shall be very simple, strong, and durable in construction, which can be constructed with a minimum of cost, and which can be easily and conveniently controlled and manipulated.

In the annexed drawings, Figure 1 is a perspective view of our improved kiln. Fig. 2 is a horizontal section on the line *xx* of Fig. 3, and Fig. 3 is a longitudinal vertical section on the line *yy* of Fig. 2.

Like letters of reference denote corresponding parts in all the figures of the drawings, referring to which—

A designates the body of our improved kiln, preferably cylindrical in form, and having a dome, B, and two sets or tiers of fire-arches or furnaces, C D, arranged at one side of the kiln, and one above the other, as shown in Figs. 1 and 3. The lower series of arches or furnaces each communicate with a flue, E, separated from the fellow flues of the furnaces by intermediate partition-walls, E'. The upper series of furnaces, D, are preferably lesser in number than the lower series, C, and communicate with upwardly-extending flues F, built or secured upon the inner faces of the kiln-body or burning-chamber A, adjacent the entrance or opening of said furnaces which communicates with the interior of the kiln and isolated or separated from the flues E of the lower series of furnaces, C, by horizontal partition-walls *d* at their bottom. (See Fig. 3.)

G designates a series of transverse partition-walls arranged a short distance from each other, to leave intermediate spaces or flues, *g*, which communicate with the flues E and permit the passage of the products of combustion to pass therefrom into the body of the kiln or burning-chamber A. The partition-walls G are arranged transversely across the plane of the flues E, and extend from the point where the flues E communicate with the fire-boxes or furnaces to a point near the rear or opposite end of the kiln.

For convenience, we will hereinafter designate as the front of the kiln the point where the fire-boxes or furnaces C D are located, and the rear thereof the point where the flues E terminate, and where the chimney or outlet is located.

H designates the chimney, arranged at the opposite or rear end of the middle flue E, and which communicates therewith at its base, to convey the heated gases and products of combustion therefrom and from the remaining flues and burning-chamber of the kiln, as will appear more fully hereinafter.

I designates bridge-walls or partitions, arranged transversely across in a vertical position of the side flues E, and adapted to force or cause the heat, &c., from said flues to pass into the body of the kiln through the transverse flues *g*; and J designates a damper or valve arranged in the middle flue E, and pivoted therein at its lower end by pins, a rod, or other suitable means, and operated by a valve rod or stem, J', passing rearwardly through the flue and the chimney outside of the same, to enable the valve to be conveniently manipulated to open or close the draft, or permit the passage of the products of combustion, heated gases, &c., to the chimney.

K designates semicircular bridge-walls or partitions, arranged at the ends of the side flues, and forming, in connection with the partitions I, an escape-chamber for the products of combustion, &c., said chamber being designated by the letter L and communicating with the middle flue E, beyond or in rear of the pivoted valve or damper, and with the chimney.

M designates a series of radial partitions arranged above the chamber L a short distance from each other to provide intermediate

spaces or flues, *m*, which communicate with the kiln-body and with the escape-chamber to permit the products of combustion, heated gases, &c., to pass from said kiln to the escape-chamber, and thence to the chimney.

N designates a partition or cover, arranged over the rear end of the middle flue *E*, in alignment with the partitions *M*, and having a slot, *n*, which communicates with the flue and kiln, as is obvious.

The operation of our improved kiln is as follows: The tile or other ware is placed in the kiln, in the ordinary well-known manner, to leave intermediate spaces for the passage of heat, &c., and the fires in both of the tiers of furnaces are started, from whence the heat and smoke pass through the flues *E*, *F*, and *g* into the body of the kiln, and thence to the chimney through the escape-chamber *L* and rear end of the middle flue *E*, the damper or valve being opened. This operation is continued until the wares or tile have been half burnt, or the condition known as "water-smoking" has been reached, when the valve or damper is closed, and the heat, &c., is retained within the kiln-body and reverberates back and forth therein.

We attach especial importance to the peculiar construction and arrangement of the upper and lower series of furnaces and their conducting-flues. The heat and other products of combustion from the upper series of furnaces are conveyed into the kiln to the top or dome thereof by the upwardly-extending flues *F*, and pass downwardly through the ware or tile and meet the counter-current of ascending heat and products of combustion from the flues *E* of the lower tier of furnaces, the two currents intimately commingling and thoroughly heating the kiln, and burning the ware or tile before passing to the chimney, beside insuring a strong steady draft to support the combustion in the furnaces. The flues or spaces between the partitions *M* are very narrow or contracted, and permit of the escape of but a limited quantity of heat and products of combustion from the interior of the kiln into the escape-chamber when the valve is closed; but when the tile or ware has been subjected to the burning process a sufficient length of time the valve is opened and the heat, &c., escapes through the middle and horizontal flues to the chimney, as will be very readily understood.

It will be observed that our improved kiln is very simple in construction, rapid in operation, economizes in the consumption of fuel, thoroughly and evenly burns the tile, by rea-

son of the counter-currents of heat from the combustion or fire-boxes intimately commingling and thoroughly heating the chamber, can be conveniently and easily manipulated, and, by reason of its simplicity, can be built or constructed comparatively cheap.

Various changes in the form and proportion of parts and details of construction can be made without departing from the spirit or sacrificing the advantages of our invention, the essential features of which will be readily understood from the foregoing description, taken in connection with the drawings.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a kiln, the combination, with the body, of two series of furnaces arranged one above the other, flues *F*, communicating with the upper series of furnaces and conveying the heat to the dome of the kiln, a series of flues, *E*, communicating with the lower tier of furnaces and conveying a counter-current of heat to the current of the flues *F*, and an exit-chimney, substantially as described.

2. In a kiln, the combination, with the body *A*, of two series of furnaces arranged one above the other and having a series of flues adapted to convey currents of heat and products of combustion in opposite directions, a series of transverse partitions, *G*, an escape-chamber, *L*, communicating with the chimney, and a regulating valve or damper, substantially as described.

3. In a kiln, the combination of the following elements, namely: a body, *A*, a series of furnaces, *C*, having longitudinal flues *E*, a series of furnaces, *D*, arranged above the furnaces *C* and having upwardly-extending flues *F*, isolated from the flues *E* by partitions *d*, a series of horizontal partitions, *G*, arranged transversely of the flues *E*, an escape-chamber, *L*, a chimney with which the chamber *L* communicates, bridge-walls *I K*, a series of radial partitions, *M*, arranged in the plane of the partitions *G*, and a damper or valve pivoted in the middle one of the flues *E* and having an operating-rod, substantially as described.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in presence of two witnesses.

LEWIS F. WICKERS.
BARNEY C. WICKERS.

Witnesses:

D. B. BANTER,
BARTON S. HIGGINS.