(No Model.) 2 Sheets—Sheet 1.

# A. B. HORNE.

## BRICK KILN.

No. 493,930. Patented Mar. 21, 1893.

Fig. 1.

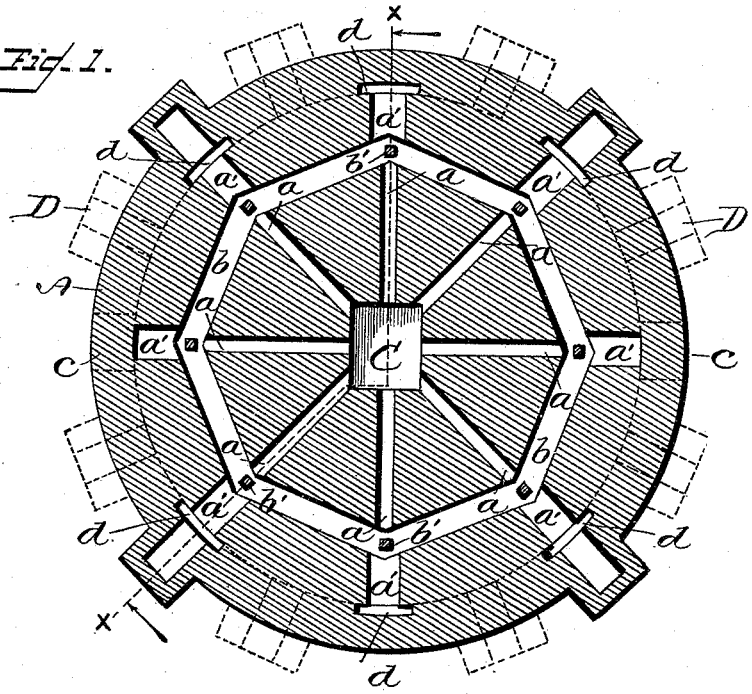
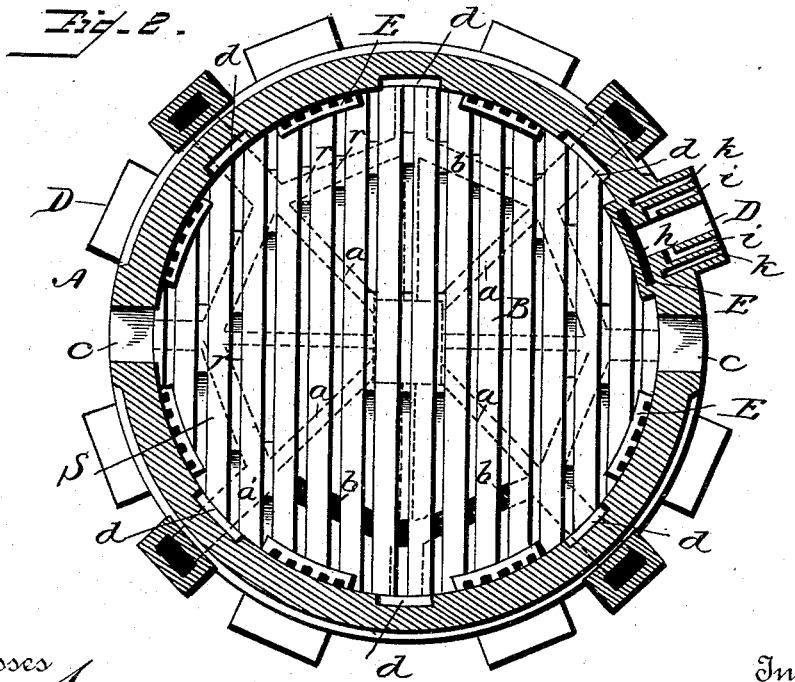



Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

# A. B. HORNE.

## BRICK KILN.

No. 493,930. Patented Mar. 21, 1893.

Fig. 3.

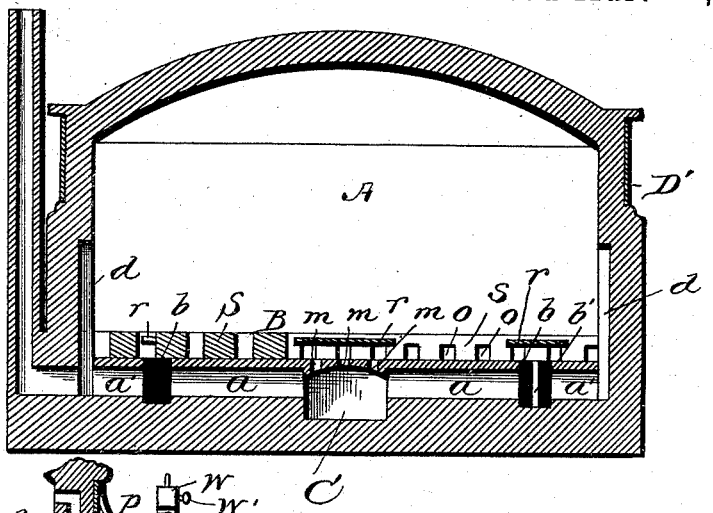



Fig. 4.

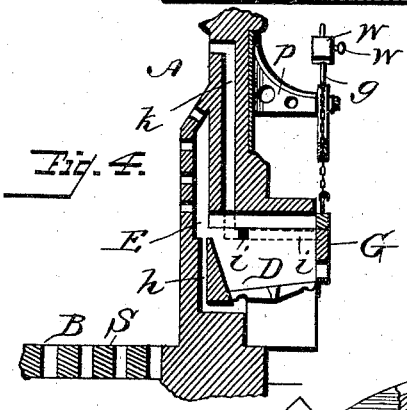
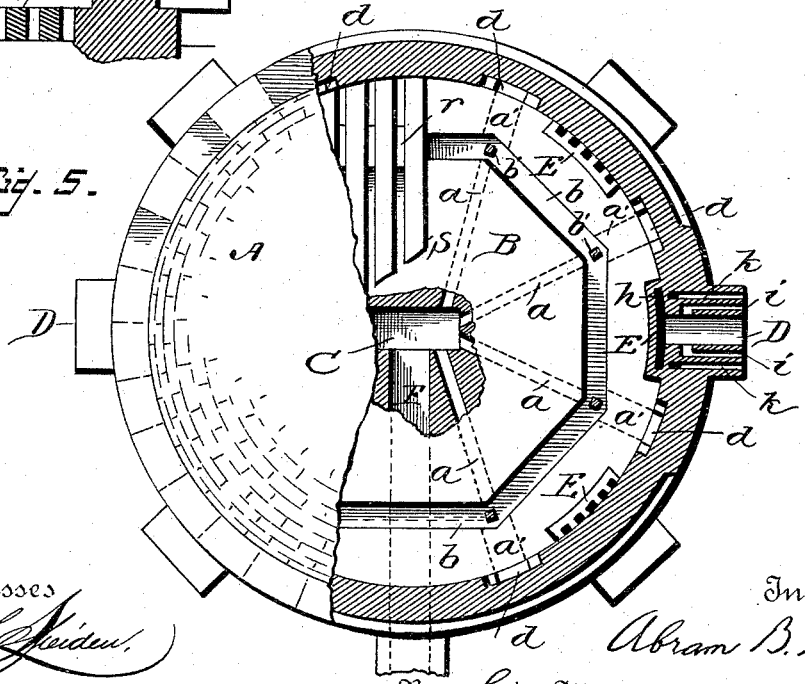



Fig. 5.

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# UNITED STATES PATENT OFFICE.

ABRAM B. HORNE, OF LOGAN, OHIO.

## BRICK-KILN.

SPECIFICATION forming part of Letters Patent No. 493,930, dated March 21, 1893.

Application filed June 20, 1892. Serial No. 437,356. (No model.)

*To all whom it may concern:*

Be it known that I, ABRAM B. HORNE, a citizen of the United States, residing at Logan, in the county of Hocking and State of Ohio, have invented certain new and useful Improvements in 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 appertains to make and use the same.

My invention relates generally to kilns for burning brick, tile, pottery, and other clay products, but more particularly to what are known as "down-draft" kilns.

One object of my invention is to simplify and cheapen the construction of such kilns so as to increase their capacity and durability.

Another object is to secure a more thorough distribution and utilization of the heat so that the goods shall be more evenly, quickly, and cleanly burned, and without increasing the amount of fuel consumed.

To these ends my invention consists principally of an improved construction of floor and manner of connecting the flues thereof.

It also consists in other details of construction, all of which are hereinafter fully described and defined in the claims.

In the accompanying drawings, Figure 1 is a horizontal sectional view taken on a plane passing through the system of flues. Fig. 2 is a horizontal section taken on a plane above the floor of the kiln. Fig. 3 is a vertical section taken on the line $x$--$x$ of Fig. 1. Fig. 4 is a sectional view illustrating a furnace, a fire bag, and fresh air flues. Fig. 5 is a horizontal sectional view taken on a plane passing through a system of flues of a kiln embodying my improvements as constructed when several kilns have a common draft stack.

In the figures shown the letter A designates the superstructure of a kiln, and B the floor. Located in the center of the floor is the draft pit C from which radiate eight flues $a$ that are covered tightly from the central pit to the point where they enter the octagonal concentric flue or channel $b$ so that no sand or débris can fall into said flues $a$ and impede the free circulation of the products of combustion. Extending from points opposite the ends of flues $a$ in the octagonal channel $b$ to the wall are spaces or channels $a'$. In the walls at the extremities of the flues $a'$ not connected with the doors $c$ I form recesses or panels $d$. The arching over the central draft pit C has a number of openings $m$ for the passage of the products of combustion. Upon the floor are constructed parallel stringers S each having a series of openings $o$ for the free passage of the heat. These openings in the stringers are preferably staggered with respect to each other so as to insure a complete circulation and commingling of the products of combustion. The channels $b$ and $a'$ are open at their upper sides, and to prevent sand and débris from falling into them the spaces between the stringers where they span said channels are corbeled, as shown at $r$. The spaces between the stringers where they extend over the central draft pit is also corbeled so as to prevent sand, &c., from falling into said pit.

Fire boxes D, with fire bags E, are arranged at suitable intervals around the kiln. The fire bags have openings in their tops, fronts, and sides. A fresh air flue $h$ leads from beneath the grate into the lower part of the fire bags, and a similar flue $i$ conducts fresh air from the exterior of the kiln into the upper part of the fire box. Other flues $k$ open above the fire bags. The purpose of these several flues is to supply the air at such points as will insure a thorough combustion of the smoke and other objectionable substances in the products of combustion, and also to temper the heat at its point of entrance to the kiln and thereby prevent a rapid destruction of the crown and walls.

In Fig. 1, which illustrates an isolated kiln, four draft stacks are connected with the flues $a$, and by means of openings or recesses $d$ with the interior of the kiln.

D' designates a single steel band which encircles the wall of the kiln near its top to sustain and strengthen the crown.

The usual doors $c$ are provided.

In Fig. 6 a flue F connects the central draft pit C with a stack that may serve as a common exit for the products of combustion from several kilns.

Where the stringers span the channels $b$ and $a'$ they will be supported by suitable masonry $b'$ built up from the bottom of the channels.

In operation, the heated products of combustion pass through the openings in the fire bags into the kiln, through the openings *m* into the central draft pit C, through the recesses *d* in the wall into the flues of the floor, and thence to the draft stack. In its passage from the fire bag the products of combustion spread thoroughly and equally through all the articles in the kiln, thus insuring uniformity in the character of the work. From my construction it is also clear that nearly the whole of the interior of the kiln is made available for the reception of goods to be burned. The flues cannot become clogged with sand or rubbish, and the floor is readily cleaned.

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

1. In a kiln, a floor having a central draft pit C, a channel *b* open at its upper side and extending around the floor near the outer wall, flues *a* entirely closed at the upper side radiating from the central draft pit and connecting said pit and channel *b*, flues *a'* extending from the channel *b* to the walls, recesses *d* connecting the flues *a'* with the interior of the kiln, and an exit draft opening for the system of flues, substantially as shown and described.

2. In a kiln, a floor having a central draft pit C with openings at its top, a channel *b* open at its upper side and extending around the floor near the outer wall, flues *a* entirely closed at their upper sides radiating from the central draft pit and connecting said pit with said channel, flues *a'* extending from the channel *b* to the walls, recesses *d* connecting the outer ends of flues *a'* with the interior of the kiln, stringers S on the floor, and corbeling *r* between said stringers where they span the open channel *b* and the upper side of the central draft pit, substantially as shown and for the purpose described.

3. In a kiln, a floor having a central draft pit C with openings in its upper side, a channel *b* open at its upper side and extending around the floor near the outer wall, flues *a* entirely closed at their upper sides connecting the pit C and the channel *b*, stringers S on the floor having free air spaces at their under sides, and corbeling *r* between said stringers where they span the open channel *b* and pit C, substantially as shown and for the purpose described.

4. In a kiln, a fire box and a fire bag, the latter having openings at its top, front, and sides, and the former having fresh air flues leading into the lower part of the fire-bag and fresh air flues opening above the fire bag, substantially as shown, whereby a thorough combustion of the fuel is effected as set forth.

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

ABRAM B. HORNE.

Witnesses:
W. F. BOWEN,
JOHN HAUSEN.