

(No Model.)

2 Sheets—Sheet 1.

B. SWENSON.
BRICK KILN.

No. 489,617.

Patented Jan. 10, 1893.

Fig. 1.

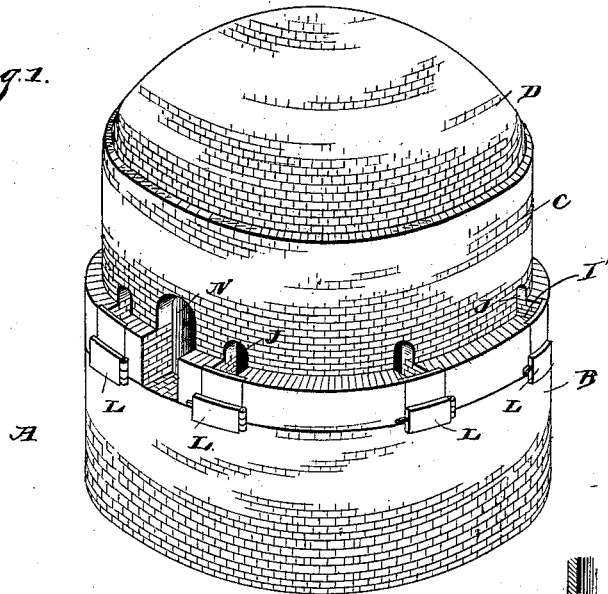


Fig. 2.

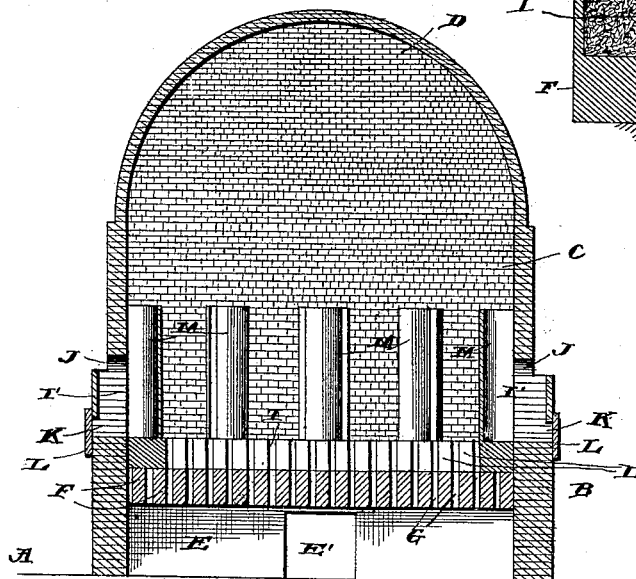
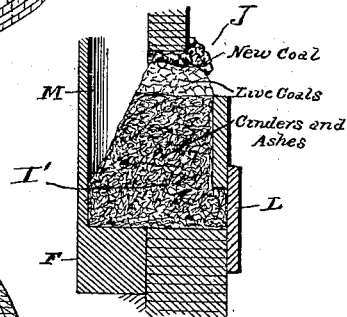


Fig. 3.



Witnesses

B. S. Olsen
D. P. Maltby

By his Attorneys,

C. A. Snow & Co.

Inventor

Benny Swenson

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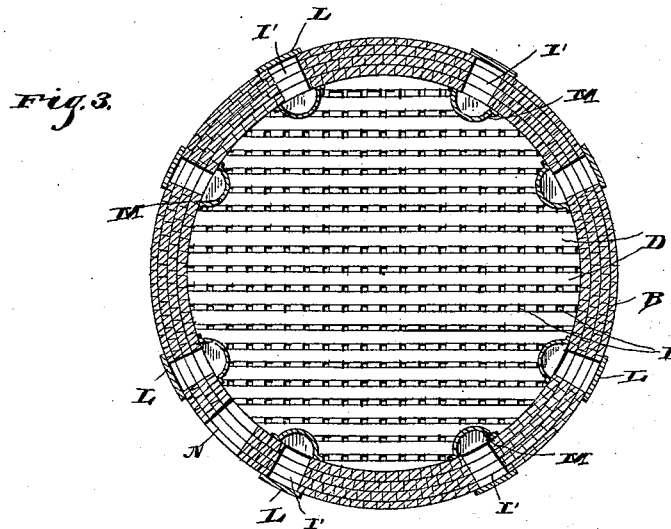
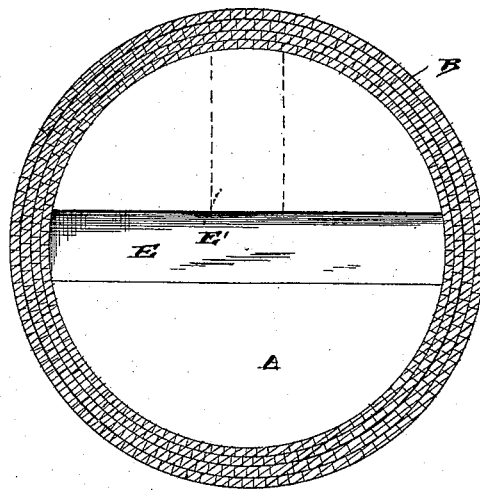


Fig. 4.



Witnesses

B. S. Obar
N. P. Walhaug

Inventor

Benny Swenson

By *his* Attorneys,

C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

BENNY SWENSON, OF ROLAND, IOWA.

BRICK-KILN.

SPECIFICATION forming part of Letters Patent No. 489,617, dated January 10, 1893.

Application filed April 5, 1892. Serial No. 427,885. (No model.)

To all whom it may concern:

Be it known that I, BENNY SWENSON, a citizen of the United States, residing at Roland, in the county of Story and State of Iowa, have
5 invented a new and useful Brick-Kiln, of which the following is a specification.

This invention relates to brick kilns and particularly to those commonly known as down-draft kilns; and it has for its object to
10 provide an improved kiln of this character which shall be so constructed and have the flues thereof, as well as the fire chambers, so arranged, as to provide means whereby all the smoke and cinders are fully consumed and
15 the heat from the fires utilized to the fullest extent, while at the same time the requisite draft is obtained. The many disadvantages of clinking are avoided, a kiln is provided which is burned in a much shorter time than
20 ordinary kilns and the same is designed to burn tile brick, or any clay articles thoroughly from the top to the bottom of the kiln and thus providing uniformity of burning which is a great requisite for good kilns.

25 With these and many other objects in view which will readily appear as the nature of the invention is better understood, the same consists in the novel construction combination and arrangement of parts hereinafter more
30 fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is a perspective view of a kiln constructed in accordance with my invention. Fig. 2 is a
35 vertical sectional view of the same. Fig. 3 is a horizontal sectional view of the kiln above the floor. Fig. 4 is a similar view below the floor. Fig. 5 is an enlarged detail sectional
40 view of one of the closed-bottom fire-pockets or chambers, illustrating the levels at which the fuel is constantly maintained.

Referring to the accompanying drawings:—A represents the base of the kiln and having a surrounding base-wall B, extending slightly
45 above the same, and upon which is built the body C of the kiln, of ordinary material and either square or round, the same being capped by the dome D, which is imperforate and serves to collect the heat and throw the same
50 back to the base of the kiln. Formed in the base of the kiln A is the main transverse flue E, open at the top to carry the draft and from

the center of which, at right angles thereto and through the base A, leads the main escape flue E' closed on all sides and which connects with the ordinary stack and passes the
55 unconsumed smoke and other products of combustion from the kiln, and allows for the requisite draft of the same. Built upon the base A, across and at right angles to the main transverse flue E, are the supplemental flue
60 walls F extending across the entire width of the kiln and forming therebetween a series of parallel transverse flues G, smaller than the main central transverse flue in the base of the kiln therebeneath. The flue walls F sup-
65 port the perforated kiln floor D, built of common brick, which are so arranged as to provide a series of small vertical draft openings I arranged along the length of the parallel flues G, and of a sufficient size to provide only
70 for the requisite draft of the kiln, while at the same time to provide for holding all the heat in the kiln and give the same the benefit of the entire heat, smoke and other products of combustion emanating from the several fire
75 chambers.

At the lower edge of the body C of the kiln and at the top of the base wall B is arranged a series of deep fire pockets or chambers I'. The said fire pockets or chambers I' open into
80 the interior of the kiln flush with the inner wall thereof but extend beyond the outside of the body C to provide means for feeding the same with fuel and allowing the requisite draft. The said fire pockets or chambers are
85 entirely inclosed upon the outer sides and their bottoms but are provided with top openings J, between the outer walls of the same and the outside of the kiln body, through
90 which openings the fuel is fed to the fire pockets or chambers, and down through which the draft alone passes to the fuel in the bottom of the pockets to sustain the fire. The
95 passing of the draft through the top of the pockets or fire chambers instead of through the bottom thereof below the grates as in old kilns, provides means whereby the smoke and
100 cinders are entirely consumed and the formation of clinkers avoided. At the front lower ends of each of the fire pockets or chambers are located the firing and cleaning openings K which are kept closed by the doors L,

while the kiln is in operation, and said openings provide means for firing up the kiln and cleaning the same after burning.

Referring to detail Fig. 5 of the drawings, the utility of the closed-bottom fire-pockets or chambers will be more apparent. It is to be observed that the combined fuel and draft openings J, are somewhat contracted in width, and have their outer edges but a short distance from the kiln wall, so that, as is clearly seen in Fig. 5, there cannot be a sufficient amount of new coal placed on top of the live coals, as to deaden the same, and therefore such new coal is just sufficient to keep the live coals covered, so as to supply the necessary fuel to the fire, and also to fill the space left between the top line of the live coals and the upper edges of the openings J, in the kiln body. The fresh air is therefore necessarily first drawn through the live coals under the new coal, to supply the necessary fresh air to support the combustion of the fuel, as will be clear.

Now it will be apparent that in starting the fires in the several pockets, a small fire of wood can be first kindled, and then the fire is built up gradually until the top of the supporting ash bed is the bottom of the live coal line, which line is flush with the upper outer edges of the openings J, as clearly indicated in the drawings. Now with the bottom of the live coal line flush with the outer upper edges of the openings J, there must necessarily be a strata of live coal supported on the hot ashes and cinders, which now extend up from the bottom of the pockets to the top of the outside walls thereof. Therefore on this bed of ashes and cinders, which latter are being gradually consumed, the live coals are always supported, and upon the top of the live coals is constantly kept a bank or filling of new coal, which, as illustrated in the drawings, fills up the space between the top of the live coals and the top edges of the openings J, in the kiln body. At the same time, the new coal of course constantly feeds the fire, so that the bottom of the live coal line never sinks below the outer upper edges of the draft openings, which condition is constantly maintained by a continual filling in of new coal on top of the live coal to fill up the remaining space of the openings J.

By reason of the construction of the fire-pockets with a solid imperforate bottom and the constant filling in of the same with new coal to sustain a bed of live coals partly in the mouth of the openings J, clinkers are positively avoided, and at the same time the cinders under the live coals are being gradually burned up. This provides for maintaining an even, though intense heat, throughout the entire kiln, thereby providing a con-

struction which allows the kiln to be burned in a much shorter time than an ordinary kiln.

Inclosing the inner openings of the fire pockets or chambers within the kiln is a series of short vertical fire flues M, secured to the inner wall of the kiln over said fire chambers or pockets and extending up a sufficient distance above the same within the kiln, so as to direct the heat, smoke and other products of combustion into the top of the kiln so that the same may return down through the brick, tile or other articles into the flues in the bottom of the kiln, thence to the smoke stack, said fire flues having their lower ends resting on the flue base to provide for a direct upward draft of the heat and other products of combustion. It will be also observed that the vertical fire flues M prevent the heat of the fire from coming into direct contact with the articles burning and thus prevent the burning of the same not being uniform. An ordinary door N, which is closed during the process of burning provides an entry for filling and emptying the kiln in the ordinary manner.

The construction and advantages of the herein described kiln being particularly set forth it is thought that the operation and further advantages of the same will be apparent to those skilled in the art without further description.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:—

The combination in a down-draft kiln having a flue base and the kiln body arranged over the base; of a series of off-standing fire-pockets or chambers arranged at the sides of the kiln body over said base, said fire-pockets or chambers being provided with solid imperforate bottoms, imperforate inclosing sides, and contracted combined fuel and draft openings at their upper ends and in the kiln body, the bottom of the live coal line being maintained constantly flush with the upper outer edges of said combined fuel and draft openings, and the new coal being adapted to cover the live coal and fill the space therebetween and the top edges of said openings in order to allow a circulation from the outside directly through said live coal, and a series of short vertical fire-flues secured to the inner wall of the kiln body and forming the inner inclosing walls of said fire-pockets or chambers, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

BENNY SWENSON.

Witnesses:

G. D. SOULE,
CARL OLESON.