

C. D. CURTIS.
BAKERS' OVEN.

No. 181,561.

Patented Aug. 29, 1876.

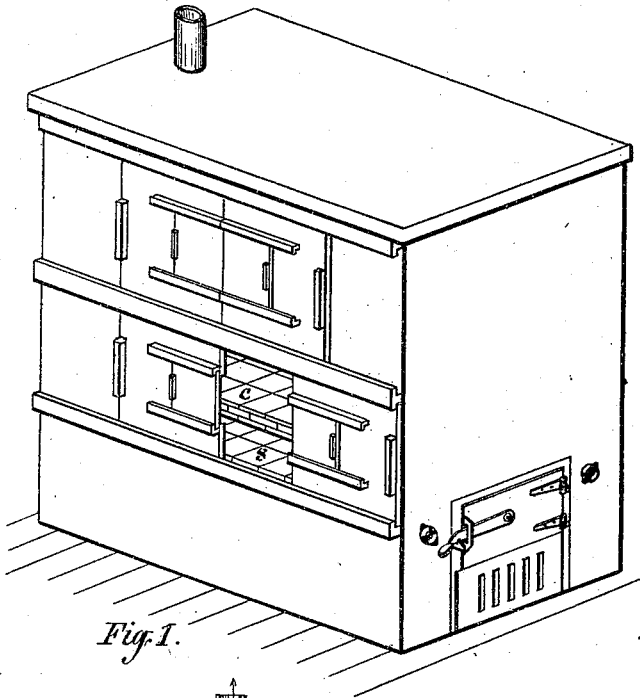


Fig. 1.

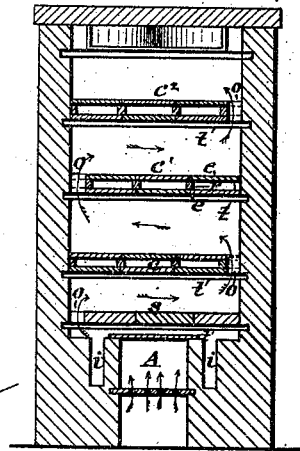


Fig. 3.

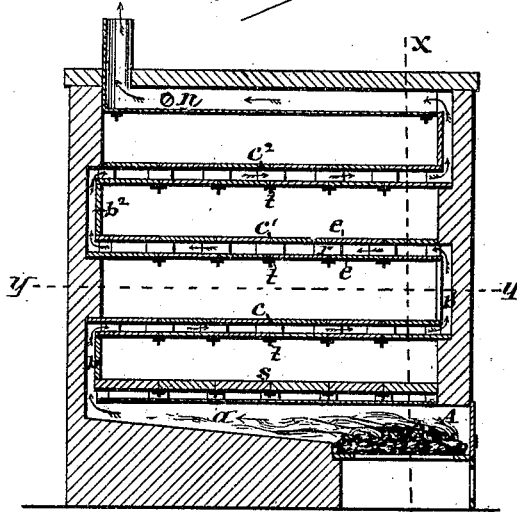


Fig. 2.

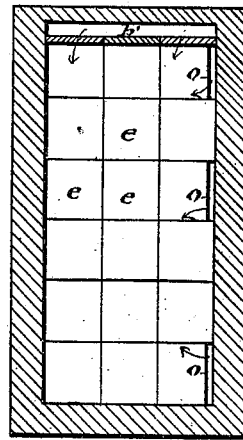


Fig. 4.

WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES D. CURTIS, OF SYRACUSE, NEW YORK.

IMPROVEMENT IN BAKERS' OVENS.

Specification forming part of Letters Patent No. **181,561**, dated August 29, 1876; application filed February 4, 1876.

To all whom it may concern:

Be it known that I, CHARLES D. CURTIS, of Syracuse, in the State of New York, have invented a new and useful Improvement in Bakers' Ovens, of which the following, taken in connection with the accompanying drawing, is a full, clear, and exact description:

The object of my invention is to obtain a baker's oven that shall occupy but very little room in comparison with its capacity, be simple and cheap in construction, readily heated and regulated, and accomplish the baking rapidly, uniformly, and completely, with a consumption of very little fuel, and also be safe from communicating fire to its surroundings. It consists in the construction and combination, with the baking-chamber, of a series of horizontal flues, extending across the entire breadth and length of the baking-chamber, and connected alternately at opposite ends by vertical flues, in such a manner as to form one continuous draft or fire flue, with a succession of returns throughout the baking-chamber, and extending from the furnace to the top of the oven, where it is provided with a suitable exit or escape, the horizontal flues being constructed to constitute shelves, upon which the baking is done; also, in the combination, with the said draft or fire flues, of cold-air flues, placed on the sides of the furnace, and having communications with the baking-chamber and draft-flue, as hereinafter described, for the purpose of admitting fresh air into the baking-chamber, and uniformly distributing the heat.

To enable others skilled in the art to construct and use my invention, I will now proceed to describe the same.

In the accompanying drawing, Figure 1 is an isometric view of the exterior of my improved baker's oven, showing its doors and outside dampers and registers. Fig. 2 is a longitudinal section of same, showing the construction of the draft or fire flues, whereby the shelves are formed upon which the baking is done, and its connection with the furnace and exit or escape flues, the arrows indicating the direction of the draft. Fig. 3 is a transverse section through xx of Fig. 2, showing the construction of the cold-air flues, and their combination with the furnace and baking-chamber, the arrows here indicating the

current of fresh air; and Fig. 4 is a horizontal section through line yy of Fig. 2, showing the opening on the sides of the shelves for the passage of air and heat.

In constructing this oven, I have found that the rectangular shape is the most suitable, in order to reduce the width of the flues, and obtain a ready distribution of heat; yet the shape may be so varied as to suit circumstances. The main or outside walls and crown are intended to be constructed of brick or stone, laid in mortar, to render them perfectly tight and compact, and properly stayed by iron rods.

A is the furnace, having the usual grate and ash-pit, and is located centrally at one end of the oven, as shown in Fig. 2. At the back end of the grate it has a bridge-wall, rising about three inches above the grate, and from thence the fire-flue a slightly ascends toward the opposite end of the baking-chamber, where it intersects the vertical flue b , which extends upward to a proper height to make room for the bottom shelf s to be placed between the furnace and the horizontal flue c . The latter is connected with the vertical flue b , and at opposite ends with the vertical flue b^1 , which extends and connects with the horizontal flue c^1 . This again intersects a vertical flue, b^2 , at the opposite end, and is thereby connected with the horizontal flue c^2 above it, and in this manner the draft or fire flue is continued to the top of the oven, forming thereby a series of flue-shelves throughout the baking-chamber. In high ovens the fire-flue is to be continued along the under side of the crown or cover, for the purpose of securing a good top heat, and provided with an escape to the chimney. In ordinary-sized ovens an iron pipe may be placed above, and connected with the last horizontal flue, and extended to the chimney. All flues, both horizontal and vertical, from the fire-flue a up, extend across the entire breadth and length of the baking-chamber, leaving merely the openings necessary for the passage of air and heat, as hereinafter described.

The horizontal flues $c^1 c^2$ are to be a proper distance apart to render them available for shelves, upon which the baking is done. They are constructed of thin flat tiles ee , with bricks

r r between them, laid lengthwise along the longitudinal joints, and are supported by iron bars *t t*, secured in the side walls. By this construction the unpleasant flavor in the bread which is imparted by the contact with iron is avoided, and the heat retained much longer, and the bars *t t* are made to serve the double purpose of supporting the shelves and bracing and tying the sides of the oven.

The bottom shelf *s*, on account of its close proximity to the furnace, is solid; and it consists of thick tiles, supported by iron bars at a sufficient height above the top of the furnace to protect it from too excessive heat, and to allow the heat a free circulation.

The furnace *A* and fire-flue *a* are covered with iron plates, so as to prevent the gas and smoke from the fire from entering the baking-chamber, and at the same time freely emit the heat generated in the furnace. *i i* are cold-air flues on the sides of the furnace and flue *a*, having registers on the outside of the oven, whereby the ingress of air can be regulated.

The air, in its passage along the sides of the furnace, prevents the heat from penetrating the outside walls, and carries the heat upward through openings *o o* on alternate sides of the flue-shelves *c c¹ c²*, as indicated by arrows in Fig. 3 of the drawing, and uniformly distributes the same through the baking-chamber. At the top of the baking-chamber it is allowed to escape through a damper, *n*, in the exit flue or pipe, and arranged to have its egress regulated.

The openings *o o* on the side of the flue-shelf can be extended along the entire length of the baking-chamber, if desired.

The oven is provided with suitable doors on the side to obtain free access to the baking-chamber, and with a damper in front of the ash-pit, whereby the draft can be regulated.

When the desired heat is obtained in the baking-chamber, (which, by the improved construction and combination of flues herein described, is accomplished in very short time,) the damper in the ash-pit is closed and all draft cut off. The oven then will retain its heat for a long time.

After numerous experiments, I found that, in order to prevent the bread from shrinking during the process of baking, and produce a sweet, pure, and healthy bread, it is essential to have a proper supply of fresh air at a high temperature, which I obtain through the flues *i i* without materially diminishing the production of heat from the furnace and bottom fire-flue, and utilize that heat, which otherwise would penetrate the outside walls and be liable to communicate fire to surroundings of the oven.

The object in using tile for flue-shelves is to avoid the unpleasant flavor in bread which is imparted by the contact with iron, and also to retain the heat much longer.

It will be observed that by my improvements I accomplish, first, a saving in room, because I occupy every available part of of the baking-chamber with baking-shelves; second, a superior article of bread by baking on tile flues, as described, with a uniform top and bottom heat, and by the circulation of fresh air; third, a saving of fuel, as but very little heat is allowed to escape into the chimney, and the heat maintained by closing the dampers and retained by the succession of return-flues; fourth, a saving in time of baking, as the oven is readily heated through the iron covering of the furnace and bottom fire-flue, and the succession of return-flues throughout the baking-chamber; fifth, safety as to fire, the heat from the furnace being prevented from penetrating the outside walls by cold-air flues on the sides of the furnace.

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

1. The combination and arrangement, in a baker's oven, of the furnace *A*, placed at the bottom centrally in one end, and the horizontal fire-flue *a*, extending to the rear end of the oven, both covered with iron plates, and having the cold-air flues *i i* on their sides, the short vertical flues *b b¹ b²* alternately at opposite ends, extending across the entire width of the oven, the horizontal tile flue-shelves *c c¹ c²* arranged one above the other, and connected at the ends with the alternating vertical flues *b b¹ b²*, and having, respectively, at opposite sides, the openings *o o*, and connected with the exit-flue at the top, and provided with the damper *n* thereat, the cross-bars *t t* tying and bracing the sides of the oven and supporting the shelves, and the solid tile-shelf *s* interposed between the furnace and bottom flue-shelf, having opening *o* on one side, all constructed substantially as described and shown, for the purpose set forth.

2. The horizontal tile flue-shelves *c c¹ c²*, constructed of two courses of earthen bakers' tiles, with brick between them, laid lengthwise under the longitudinal joints, arranged one above the other, supported on cross-bars *t t*, and connected alternately at opposite ends by the short vertical flues *b b¹ b²*, and having air-passages *o o* in opposite sides, respectively, and combined with the furnace *A* at the bottom of the oven and the exit-flue at the top, substantially in the manner and for the purpose described.

In testimony whereof I have signed my name and affixed my seal in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga and State of New York, this 14th day of September, 1875.

CHARLES D. CURTIS. [L. s.]

Witnesses:

C. HOLMSTRUP, Jr.,
E. BENDEXEN.