(No Model.)

2 Sheets—Sheet 1.

J. ERBEN & M. M. KOCH.

OVEN.

No. 525,760. Patented Sept. 11, 1894.

Fig. 1.

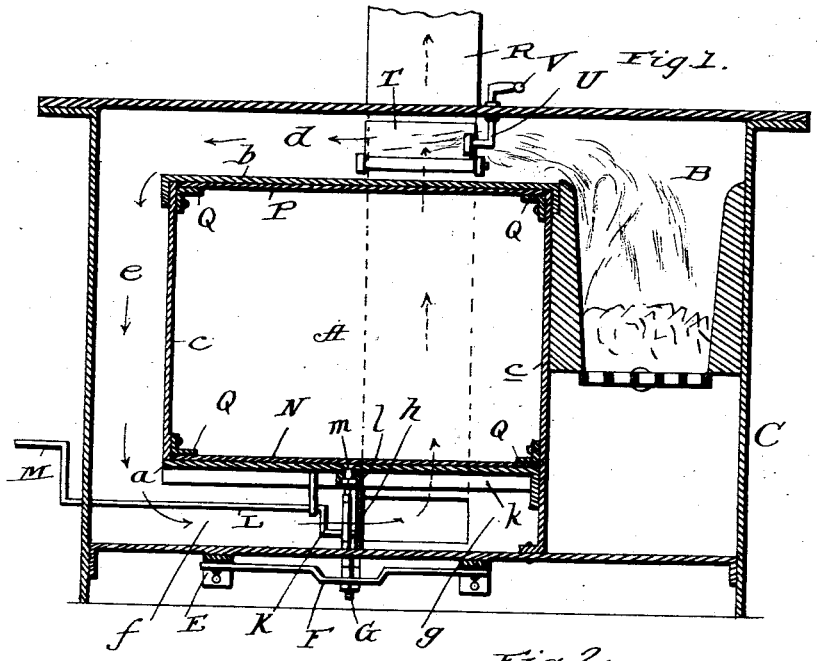
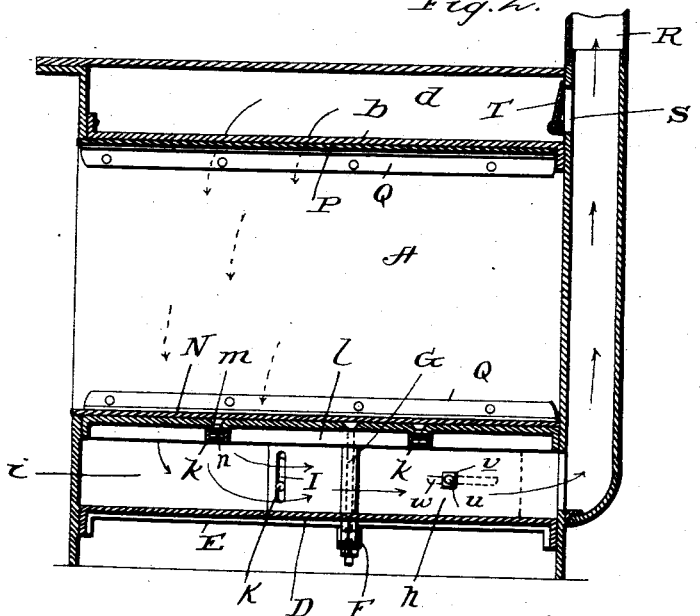


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

J. ERBEN & M. M. KOCH.

OVEN.

No. 525,760. Patented Sept. 11, 1894.

Fig. 3.

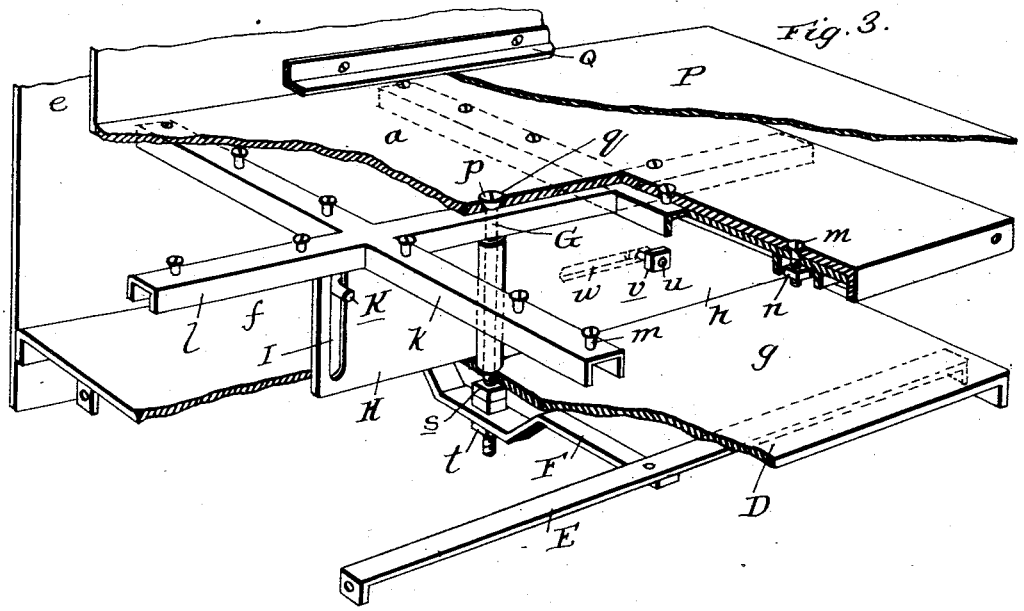
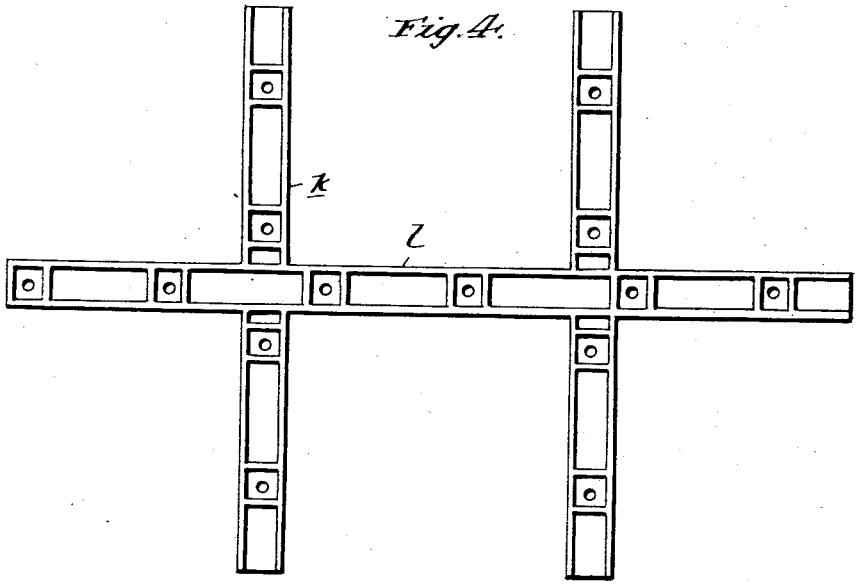


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN ERBEN AND MAX M. KOCH, OF CLEVELAND, OHIO, ASSIGNORS TO THE H. FRANKE STEEL RANGE COMPANY, OF SAME PLACE.

OVEN.

SPECIFICATION forming part of Letters Patent No. 525,760, dated September 11, 1894.

Application filed January 25, 1894. Serial No. 498,016. (No model.)

To all whom it may concern:

Be it known that we, JOHN ERBEN and MAX M. KOCH, citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Ovens; and we do 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.

This invention has relation to improvements in ovens for stoves and ranges, and it has for its prime object to improve such devices by providing a durable and effective means at a comparatively small expense for guarding against, and when such occurs, returning warped oven plates or walls to their normal condition.

Another object of the invention is to adapt a sheet metal oven to receive protecting plates, whereby the unequal heating of the walls will be guarded against and articles being baked or cooked will be prevented from burning or subjected to greater heat on the top than on the bottom, and vice versa.

A further object of the invention is to economize in fuel by providing a regulator for the hot air currents and the particles of combustion around and beneath the oven.

Other objects and advantages will appear from the following description and claims when taken in connection with the annexed drawings, in which—

Figure 1, is a vertical, transverse, sectional view of an oven and fire box, constructed according to our invention. Fig. 2, is a similar view taken in the plane at right angles to Fig. 1. Fig. 3, is a detail, perspective, sectional view of the oven illustrating the improvements on an enlarged scale, and Fig. 4, is an inverted plan view of the strengthening ribs or braces for the outer bottom plate of the oven.

It is well known that sheet metal ovens are very desirable in cooking-stoves and ranges, inasmuch as they may be quickly heated and the thinner the metal used in the construction of the oven, the quicker results can be obtained in baking purposes. It has been found very objectionable however to use thin sheet metal in the construction of ovens for the reason that the great heat to which the walls are subjected, commonly cause the bottom wall, at least, to buckle and warp, and it has been found furthermore objectionable for the reason that when a large fire is used, the articles baking will burn on the top before being cooked on the bottom. These objections we have overcome by our improvements and the additional cost to apply such improvements in the manufacture is comparatively small.

Referring by letter to the accompanying drawings: A, indicates the oven; B, the fire box, and C, a casing.

The casing and fire box may be of any suitable character, and are here shown simply for the purpose of illustrating the improvements we have made on the oven and its attachments.

The oven which is suitably arranged within the casing is composed of a plate of sheet metal, shaped into rectangular form or other suitable configuration, and comprises the bottom wall *a*, the top wall *b*, and the side walls *c*. This oven is disposed within the casing so as to provide a top flue *d*, leading from the fire box over the top of the oven, a vertical side flue *e*, leading down one side of the oven and a horizontal flue or chamber divided into two compartments *f*, and *g*, by a central vertical partition *h*, which extends from one of the walls of the oven shell to about midway of the length of the horizontal flue or chamber *i*, as shown.

Secured to the under side of the bottom wall *a*, of the oven, are ribs or braces *k*, and *l*. These ribs are preferably formed of cast iron and may be made hollow or channeled as shown, and are disposed relatively at right angles to each other on the under side of said plates by means of short bolts or screws *m*, and nuts *n*, or other suitable fastening devices; the heads of the screws or nuts being countersunk in the plate *a*.

In the present illustration, we have shown a single central rib *l*, with two sets of cross ribs on the bottom plate of the oven but it is obvious that the number may be increased or lessened, and disposed or arranged according

to the fancy or dictation of the mechanic, and the ribs may be cast entire or formed in separate parts as may be desired.

Closing the base flue or chamber *i*, is a plate D, which may be secured to the casing by straps E, or the like. Arranged beneath this plate D, is an angular bracket F, which has an aperture in its center, and is here shown as secured at opposite ends to the straps E, although it may be secured below the plate D, in any suitable manner.

G, indicates a central, vertically-disposed adjusting bolt or rod. This bolt has a head *p*, at its upper end, which is countersunk in an aperture *q*, in the center or other suitable point in the bottom plate *a*, of the oven, and this bolt passes down to an aperture in one of the cross ribs or braces secured to said oven plate, thence down through a vertically-disposed eye in the outer end of the vertically-disposed partition or flue strip *h*, after which it passes through the aperture in the angular bracket F. The lower end of this adjusting rod is threaded as shown and nuts *s*, and *t*, are employed on said rod above and below the bracket for fixing its position with respect thereto and consequently serving to adjust the bottom plate of the oven.

By providing the ribs or braces, there will be considerable rigidity given to the bottom plate of the oven, but even with this precaution, the intense heat to which it is subjected, will have a tendency to buckle or warp the sheet, so in order to take out the warping and restore the sheet to its normal straight condition, it is simply necessary to manipulate the nuts upon the adjusting bolt or rod, or by any suitable means to draw down the rod and secure it. This can be very conveniently effected by the employment of a wrench, but we do not wish to be understood as confining ourselves to any particular construction for removing the warp through the medium of an adjusting bolt or the like.

With a view of economy and saving of fuel, as well as obtaining good results, we have provided the flue strip or vertical partition *h*, below the oven, and about midway thereof. This strip is designed to close half, more or less, of the flue or chamber *i*, and in order that more of the passage or flue may be obstructed, and the course of the heat and particles of combustion directed entirely around the oven, we have provided a draft regulator or slide H. This slide H, is held in a vertical position against the flue strip or partition wall *h*, and partly overlapping the same by means of a headed bolt *u*, and a nut *v*, or the like. The slide H, is provided at a suitable point in its length with an elongated slot *w*, for the passage of the bolt *u*, or the slide may be otherwise suitably sustained. The slide is provided at its outer end with a transverse, vertically-disposed slot I, to receive the cranked end K, of an operating shaft L, which is journaled in suitable bearings, and after passing out through the casing is provided with a crank handle M, for manipulation. It will thus be seen that by manipulating the shaft L, the course of the heat, smoke, &c., will be deflected in its passage beneath the oven so as to extend over a greater area; thereby utilizing the same and effecting an economy in fuel by the saving of the heat.

It has sometimes been found that owing to the great heat to which the bottom plate of the oven is subjected, such plate will burn and become otherwise impaired, and in order that the objection should not extend into the oven, we have provided an auxiliary or supplemental bottom plate N, and we have also provided a supplemental or auxiliary top plate P, for reducing the temperature of the heat on the top of the oven, so as to obviate the burning or too rapid baking on the top before sufficient heat has been obtained at the bottom of the articles in the oven. These supplemental top and bottom plates should be removable so that in some cases, they may be taken out by the cook or attendant when it is desired to get a high heat all around the oven. These plates are held in position contiguous to the top and bottom plates of the main oven and on the inner sides thereof by means of strips Q, secured in the corners of the oven walls and against the sides. The strips have a flange whereby they may be attached to the side walls of the ovens by bolts or screws and they also have a flange to serve as a rest for said plates; the latter flanges being disposed with respect to the top and bottom main walls of the oven so as to provide a slide way between said flanges and walls for the reception of the plates. This is a convenient means of holding the plates and allowing them to be slid in and out easily, but we are aware that other means might be employed for this purpose without departing from this feature of our invention.

The uptake or smoke flue R, leads from one side of the horizontal flue *i*, and this smoke flue has communication directly with the fire chamber and top flue *b*, by means of an aperture S. A damper T, is employed for closing this aperture S, when it is desired that the smoke and particles of combustion should first pass around the oven before being discharged into the chimney. As a convenient means of manipulating this damper, we provide a rod U, extending through the casing and having on its outer end a handle V.

In operation, it will be seen that when the damper T, has been closed, the smoke, gases and particles of combustion will pass over the top of the oven through the flue *d*, thence down the side of the oven by the flue *e*, and into the bottom or horizontal flue *i*, where it can be controlled by the regulator H, so as to entirely surround the oven before being let into the smoke pipe R, from whence it is carried off to the chimney.

While we have shown and described the draft regulator in the base or horizontal flue of the oven, yet we have not claimed the same

herein, as that part of our invention forms the subject matter of a separate application, which we have filed even date with this one, and bears Serial No. 498,015.

While we have shown and described single plates for protecting the top and bottom walls of the oven, yet in some cases we may secure two or more plates together so as to obtain a double thickness or the slide way can be made sufficiently large to receive a thicker plate, or even a number of separate and disconnected plates may be placed in the slide ways so that the heat desired in the oven can be controlled and the walls protected in this way.

As a modification of the means for preventing and taking out the buckling of the oven, we would dispense with the vertical bolt and its present connections and employ a worm gear or eccentric and we are also aware that still other modifications might be made in this feature of the invention, so we would have it understood that we reserve the right to make such changes and alterations as may fairly fall within the scope of our claims.

Having described our invention, what we claim is—

1. The combination with a sheet metal oven, having ribs or braces on its under side, and an adjusting bolt for preventing and removing warp in the bottom, substantially as specified.

2. A sheet metal oven having the ribs or braces secured to the under side of the bottom wall in combination with the vertically disposed bolt, taking through said bottom wall and one of the braces, and having a bearing at its opposite end whereby said bolt may be manipulated to take out the warp of the bottom wall and also prevent the warp, substantially as specified.

3. The sheet metal oven, in combination with the flanged strips secured to the side walls in the corners thereof, and the removable plates interposed between said strips and the top and bottom walls of the oven respectively, on the inner side thereof, substantially as specified.

4. The combination with a suitable casing; of an oven arranged therein, the bracket secured to the bottom of the casing, the vertically disposed adjusting bolt, arranged at one end in the bracket, and its opposite end engaging the bottom wall of the oven, and nuts or the like for adjusting the bolt and bottom wall of the oven, substantially as specified.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN ERBEN.
MAX M. KOCH.

Witnesses:
H. J. SCHNEIDER,
PHILIP KNAPPENBERGER.