

(No Model.)

2 Sheets—Sheet 1.

F. KERNAN, Jr. & W. H. LANDERS.
FURNACE.

No. 468,401.

Patented Feb. 9, 1892.

Fig. 1.

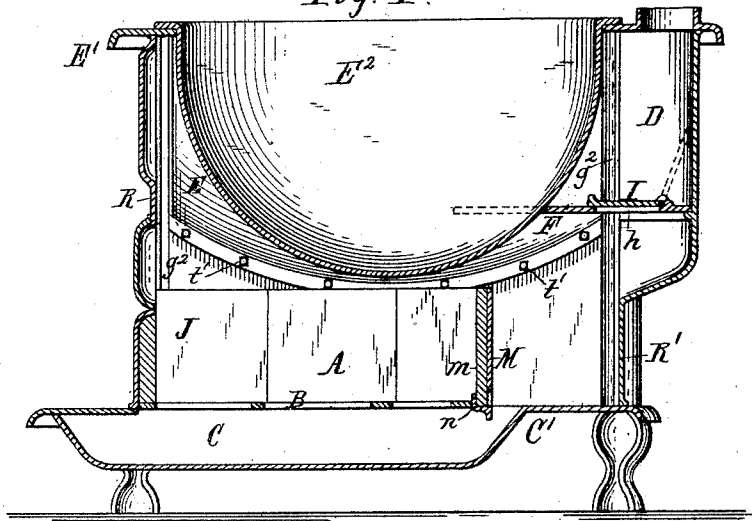
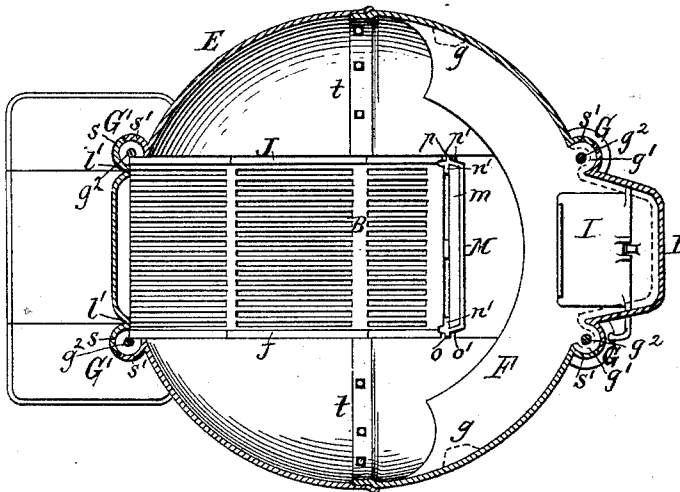


Fig. 2.



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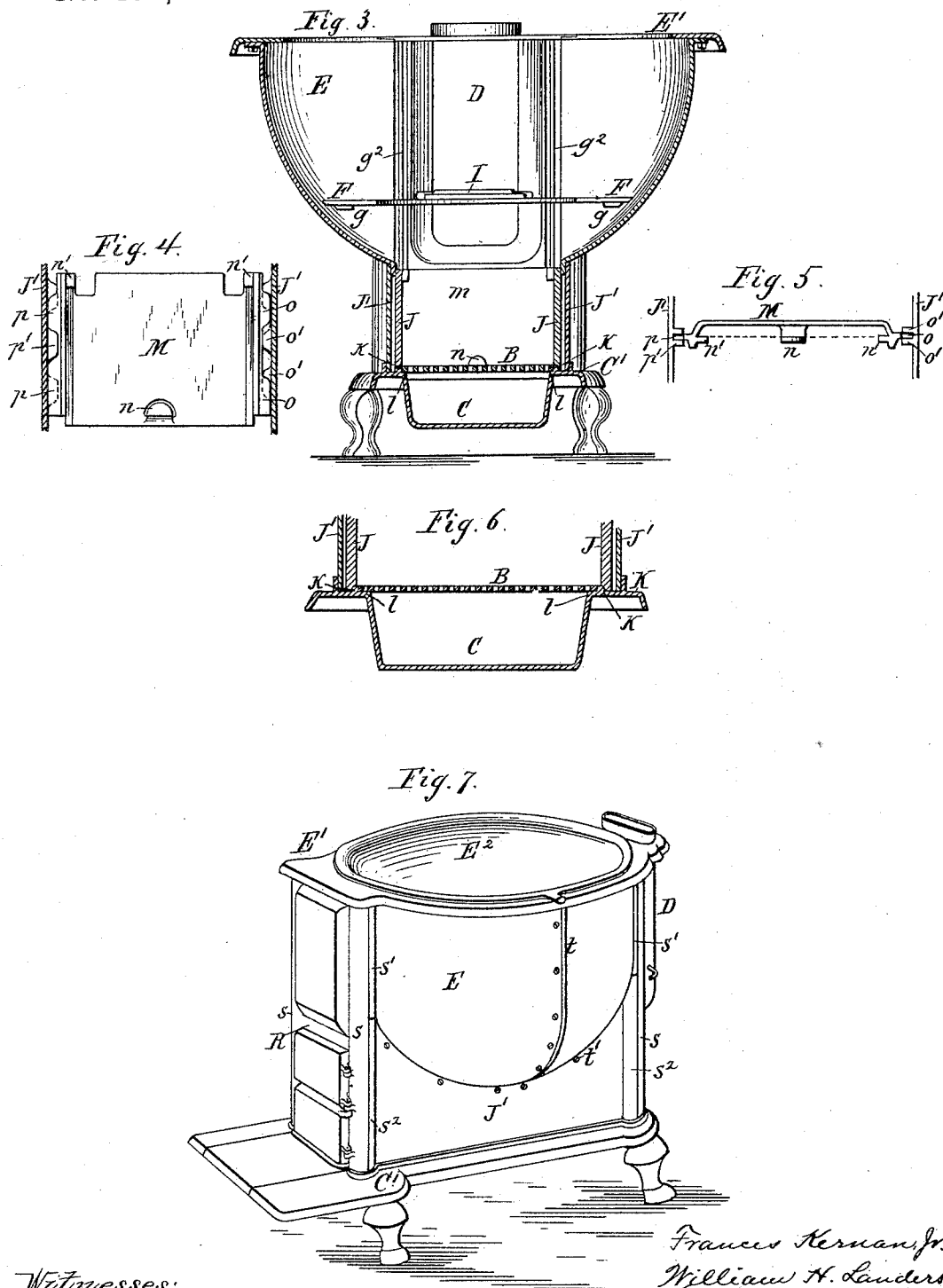
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UNITED STATES PATENT OFFICE.

FRANCIS KERNAN, JR., OF UTICA, AND WILLIAM H. LANDERS, OF SYRACUSE,
ASSIGNORS TO THE KERNAN FURNACE COMPANY, OF UTICA, NEW YORK.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 468,401, dated February 9, 1892.

Application filed January 14, 1891. Serial No. 377,717. (No model.)

To all whom it may concern:

Be it known that we, FRANCIS KERNAN, Jr., residing at Utica, county of Oneida, and WILLIAM H. LANDERS, residing at Syracuse, county of Onondaga, State of New York, citizens of the United States, have invented a new and useful Improvement in Furnaces, of which the following is a specification.

This invention relates to that class of furnaces which are used principally by butchers and farmers for boiling lard, hogs, &c., and which usually consist of a rectangular body having a laterally bulging or overhanging kettle-casing and a kettle suspended in said casing above the grate.

In order to produce an indirect draft and retard the escape of the heat and gases from the furnace, a shield or deflecting-plate has been heretofore employed, which shield was located in the smoke-pipe and extended inwardly to within a short distance of the kettle, so as to leave between the shield and the kettle a passage for the escape of the products of combustion. This construction, while retarding the escape of the products of combustion in a measure, permits a large volume of the heat and gases to escape directly through the passage between the kettle and the shield at all times, whereby a large amount of heat is wasted.

One object of our invention is to provide means whereby the direct draft may be entirely shut off, when desired, so as to utilize a greater portion of the heat.

Another object of our invention is to render the grate readily removable, so that an impaired grate may be replaced without the necessity of disturbing or removing the fire-brick of the combustion-chamber.

Other objects of this invention are to improve the details of construction.

In the accompanying drawings, consisting of two sheets, Figure 1 is a longitudinal section of our improved furnace. Fig. 2 is a horizontal section thereof in line *x x*, Fig. 1, with the kettle removed. Fig. 3 is a transverse section of the furnace with the kettle removed. Fig. 4 is an enlarged front elevation of the removable back plate of the fire-chamber and the adjacent portion of the side walls, showing the means for holding the plate

in place. Fig. 5 is a top plan view of said parts. Fig. 6 is a fragmentary cross-section of the fire-chamber, on an enlarged scale, showing the means for supporting the grate and the fire-bricks. Fig. 7 is a perspective view of the furnace.

Like letters of reference refer to like parts in the several figures.

A represents the fire-chamber of the furnace; B, the grate; C, the ash-pit forming part of the bottom plate C'; D, the smoke-pipe; E, the bulging or overhanging kettle-casing; E', the top plate resting on the same, and E² the kettle suspended in the opening of the top plate.

F is the horizontal shield or deflector-plate arranged in the smoke-pipe and the rear portion of the kettle-casing. This shield extends from the rear wall of the smoke-pipe forwardly to the kettle, and is fitted with its front edge as closely to the latter as practicable to prevent the heat and products of combustion from escaping between the shield and the kettle. The rear edge of the shield is shaped to conform to the inner wall of the smoke-pipe and the circular kettle-casing and extends forwardly nearly to the middle of the kettle-casing. The shield rests upon lugs *g*, formed on the inner side of the kettle-casing near the ends of the shield. The kettle-casing is provided at its rear side with outwardly-projecting corner columns *G* and at its front side with similar columns *G'*, which columns are open toward the inner space of the kettle-casing. The shield is provided with perforated ears *g'*, which project into the cavities of the rear columns *G* and are held in place by the tie-rods *g²*, which pass through these ears and connect the top and bottom plates. These tie-rods are arranged within the columns and the latter form embayments in the casing, in which the tie-rods are removed from the direct path of the hot current flowing along the inner sides of the kettle-casing toward the smoke-pipe and are consequently less affected by the heat, thereby rendering the top plate less liable to become loose at a high temperature.

h is an opening which is formed in the rear portion of the shield F and through which the products of combustion escape into the smoke-

pipe, and I is a damper applied to said opening and whereby the draft through the same may be shut off. The damper I preferably consists of a pivoted plate, which swings upwardly and is provided with a spindle journaled in the side walls of the smoke-pipe and a handle for turning it.

The kettle-casing is somewhat larger in diameter than the kettle, so as to leave a flue or passage between the same and the kettle, through which the heat circulates.

Upon opening the damper I a direct draft is established through the combustion-chamber and smoke-pipe, and but a small amount of heat reaches the upper portion of the kettle. Upon closing the damper the direct draft is shut off and a large part of the heat and gases in seeking an exit is deflected forwardly by the shield F and compelled to pass around the front end of the shield before escaping into the smoke-pipe. The heat and gases are in this manner confined in the furnace for a longer period than by the constructions heretofore employed, whereby the upper part of the kettle is more effectually heated and a greater percentage of heat is utilized. In starting the fire the damper is opened to obtain a direct draft, while after the fire is well under way the damper is closed to check the escape of the heat.

J represents the fire-bricks which line the side walls J' of the combustion-chamber. The bottom plate C' of the furnace extends inwardly beyond the straight side walls, and the side fire-bricks are supported upon these inwardly-projecting portions of the bottom plate, but do not rest upon the grate. The bottom plate is provided near its inner edges with a raised longitudinal rib or rim k, which confines the fire-bricks in place, as represented in Figs. 3 and 6. The grate is supported upon ledges l, which are arranged at the inner longitudinal edges of the bottom plate on both sides of the depressed ash-pit C, as clearly represented in the above-mentioned figures.

l' are projecting stops or lugs arranged at the outer ends of the ledges l for holding the grate against lengthwise displacement.

M represents the metallic back plate of the fire-chamber, which rests upon the bottom plate and is held in place between the side walls of the furnace.

m is the fire-brick attached to the removable back plate. The latter is provided on its front side near its lower end with a hook or support n, upon which the fire-brick rests and at or near its upper ends with inwardly-projecting hooks n', which overlap the upper portion of the fire-brick and hold the latter against the back plate. As represented in Figs. 4 and 5, the back plate is provided at one of its lateral edges with lugs o, which engage between two rows of internal lugs o', formed on one of the side walls of the furnace. The back plate is preferably provided at its opposite side with a continuous flange p, which engages between two rows of lugs p' on the adjacent

side wall. Upon placing the flange of the back plate between the lugs of the adjacent side wall and bringing the lugs on the opposite edge of the plate in line with the spaces between the lugs of the opposite side wall the lugs of the plate may be passed between those of the sidewall, when by depressing the plate to its proper place the coincidence between the lugs of the plate and side wall is broken and the plate thereby held in place. The plate is readily removed by raising it sufficiently to bring its lugs in line with the spaces between those of the side wall. It is obvious that the continuous flange on one side of the back plate may be replaced by lugs, if desired.

Upon opening the furnace-door and lifting the front end of the grate above the stops l' the grate may be withdrawn from the furnace without disturbing the fire-bricks or requiring the same to be removed. This permits a grate which has become unserviceable to be replaced with greater facility than by the construction heretofore employed, in which the fire-bricks rest upon the grate or grate-frame and must be removed in order to remove the grate.

The upright outer walls of the furnace comprise the front wall R, the side walls J', the kettle-casing E, the rear wall R', and the hollow corner columns G G'. Each side of the kettle-casing is divided by a perpendicular joint t at the middle. Each column G G' is composed of an outer portion s, which extends from the top to the bottom plate and is cast integral with the front or rear plate, respectively, an upper inner portion s', which is cast integral with one part of the kettle-casing, and a lower inner portion s'', which is cast integral with the side plate. The lower edge of the kettle-casing is secured to the upper edge of the side plate by screws t'. This construction permits the parts to be easily molded and cast and to be readily secured together.

We claim as our invention—

1. The combination, with the bottom plate, the kettle-casing provided at its rear side with outwardly-projecting hollow columns and with inwardly-projecting lugs, and the top plate, of a horizontal shield resting on said lugs and provided with perforated ears which project into the hollow columns and tie-rods arranged within said columns and passing through said ears, substantially as set forth.

2. The combination, with the bottom plate of the furnace, the side walls, and the grate, of a removable back plate resting upon the bottom plate and against the side walls of the furnace and provided along its lower end with a pocket in which the fire-brick rests, substantially as set forth.

3. The combination, with the bottom plate and the grate, of side walls provided with inwardly-projecting lugs separated by open spaces, and a removable back plate having laterally-projecting lugs which rest against

the lugs of the side walls when the back plate is in its normal position and which can be withdrawn through the spaces between said lugs upon raising the back plate, substantially as set forth.

4. The combination, with the front plate having the front portion of the corner column cast integrally therewith, of a kettle-casing composed of two parts, each having the upper inner portion of a corner column cast integrally therewith, and a side plate secured at its upper edge to the kettle-casing and hav-

ing the lower inner portions of two corner columns cast integrally therewith, the said corner columns forming embayments in the kettle-casing opening inwardly, substantially as set forth.

Witness our hands this 2d day of January, 1891.

FRANCIS KERNAN, JR.
WILLIAM H. LANDERS.

Witnesses:

CARL F. GEYER,
CHESTER D. HOWE.