

No. 803,610.

PATENTED NOV. 7, 1905.

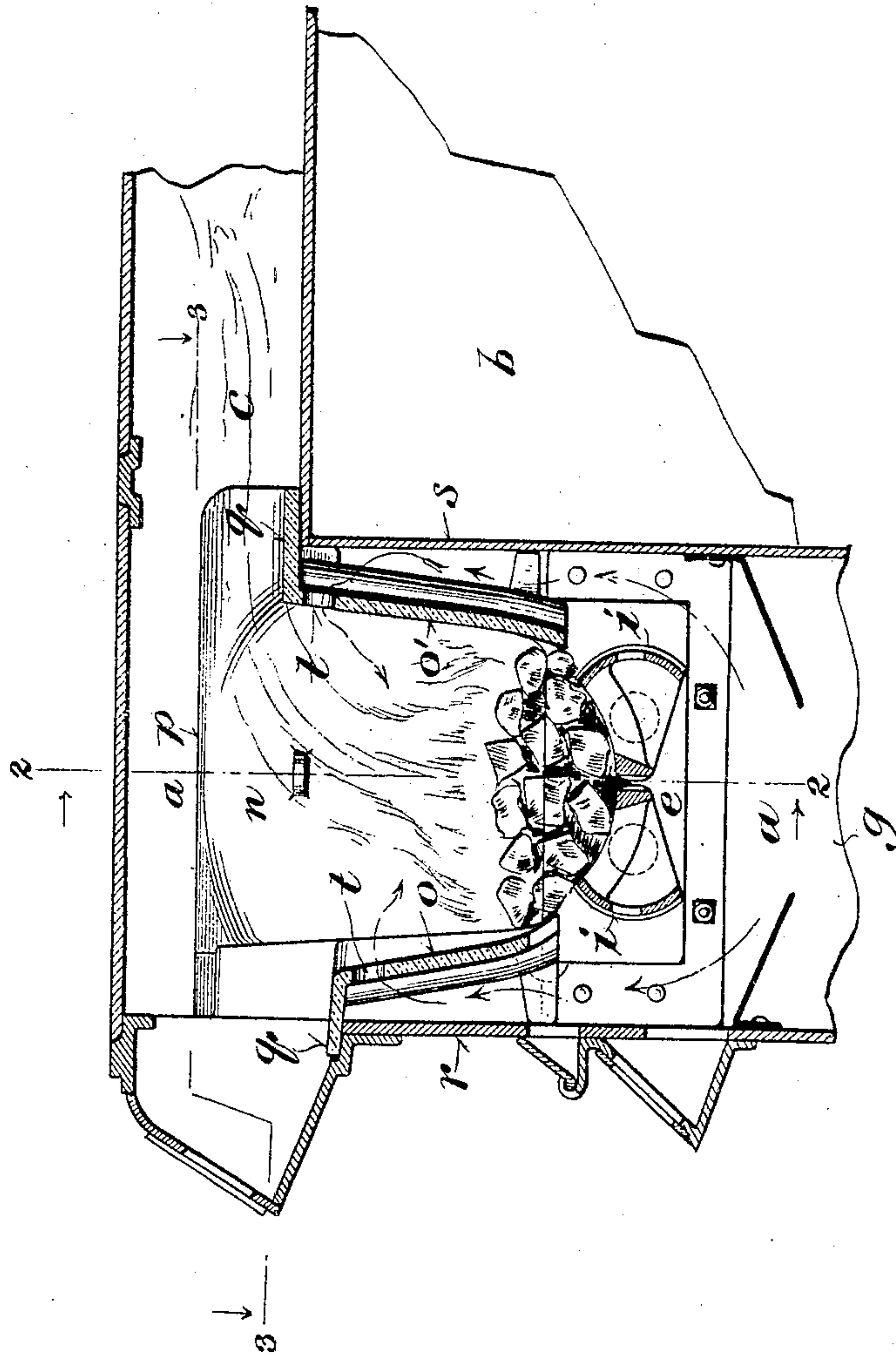
A. J. LINDEMANN & C. M. ZWECK.

STOVE.

APPLICATION FILED JULY 21, 1904.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses
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3 SHEETS—SHEET 2.

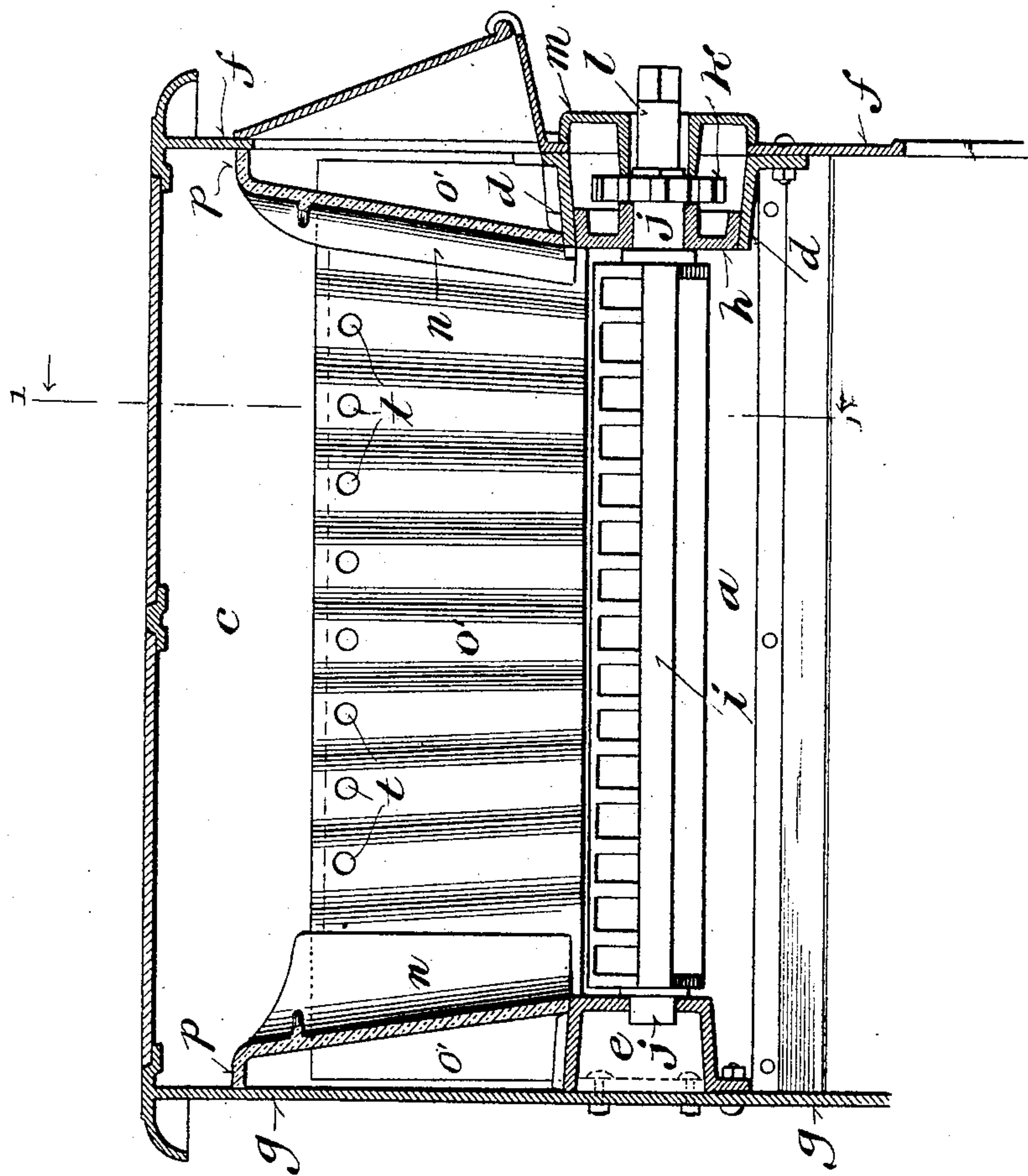


Fig. 2.

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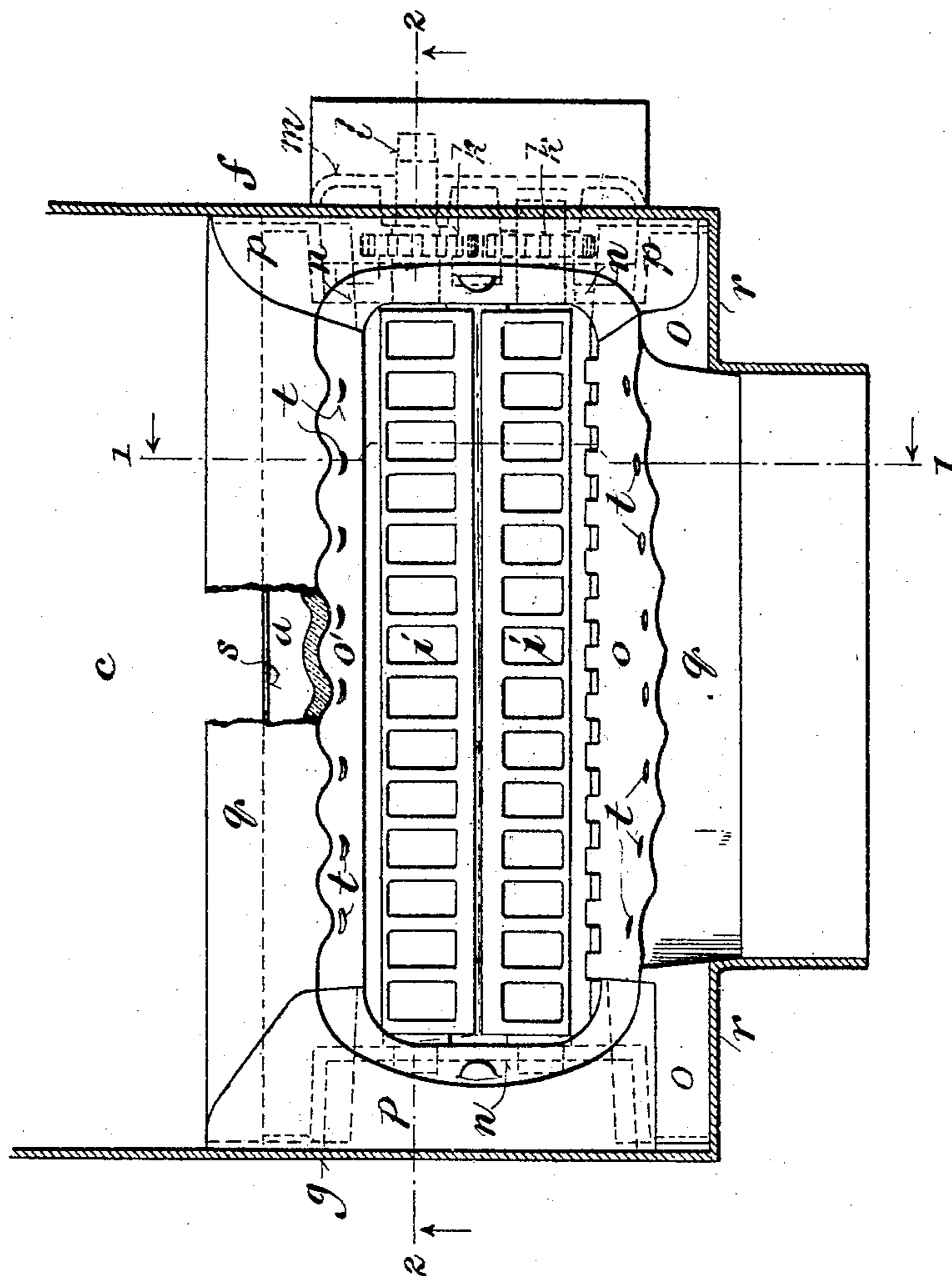
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3 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

ALBERT J. LINDEMANN AND CHRISTIAN M. ZWECK, OF MILWAUKEE, WISCONSIN, ASSIGNORS TO A. J. LINDEMANN AND HOVERSON COMPANY, OF MILWAUKEE, WISCONSIN, A CORPORATION OF WISCONSIN.

STOVE.

No. 803,610.

Specification of Letters Patent.

Patented Nov. 7, 1905.

Application filed July 21, 1904. Serial No. 217,442.

To all whom it may concern:

Be it known that we, ALBERT J. LINDEMANN and CHRISTIAN M. ZWECK, citizens of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Stoves, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

This invention relates more particularly to cooking-ranges which have comparatively long and narrow fire-pots and longitudinal grate-bars. Its main objects are to secure more complete combustion, to avoid soot and smoke, to preserve the fire-pot, to facilitate the removal and renewal of the fire-pot and grate-bars, to dispense with the usual grate-frame and fire-pot support, and generally to simplify and improve the construction and operation of stoves of this class.

It consists in certain novel features of construction and in the peculiar arrangement and combinations of parts hereinafter particularly described, and pointed out in the claims.

In the accompanying drawings, like letters designate the same parts in the several figures.

Figure 1 is a vertical section on the line 1 1, Figs. 2 and 3, of a part of a cooking-range embodying our improvements. Fig. 2 is a vertical section on the line 2 2, Figs. 1 and 3; and Fig. 3 is a horizontal section on the line 3 3, Fig. 1.

a designates the fire-chamber, *b* the oven, and *c* the top flue of the range.

d and *e* are grate and fire-pot supporting-castings bolted or attached to the end plates *f* and *g* of the fire-chamber. These castings project inwardly from the walls of the fire-chamber, and the casting *d* is formed with an opening through it corresponding with an opening in the plate *f*, the opening in the casting being tapered and converging inwardly. A bearing-piece *h* is removably fitted in and normally closes the opening in said casting, as shown in Fig. 2.

i i are rocking grate-bars of the usual or any suitable form and construction, such as are usually employed in ranges of this class. They are formed at their ends with trunnions *j*, which are fitted to turn in the casting *e* and the bearing-piece *h*, with which they are removable through the opening in the casting

d and the plate *f*. The trunnions at the front ends of the grate-bars are squared and provided with removable intermeshing gears *k*, as shown in Figs. 2 and 3, and one of these trunnions is formed with an extension *l*, which is squared to receive a crank or handle for rocking or turning the grate-bars.

The opening in the plate *f* is normally closed, and the bearing-piece *h*, with the gears *k* and grate-bars, is retained in place by a removable cover *m*, formed with an inwardly-flanged opening, through which the extension *l* projects.

The fire-pot is composed of removable sections *n*, *n'*, *o*, and *o'*, preferably made of cast-iron. The end sections *n* are formed at the top with outturned flanges *p*, which normally bear against the end plates *f* and *g* of the fire-chamber, and they rest at their lower edges upon the castings *d* and *e*, as shown in Fig. 2. The front and back sections rest at their ends on the castings *d* and *e*, as shown in Fig. 2 and indicated by dotted lines in Fig. 3, and are formed, as shown in Figs. 1 and 3, at the top with outturned flanges *q*, which rest upon the front and back walls or plates *r* and *s* of the fire-chamber, forming therewith air passages or spaces, which are entirely open into the fire-chamber below and communicate through openings *t* just below the flanges *q*, with the upper part of the fire-pot above the normal level of the fuel or fire bed therein.

The sections *o* and *o'* are preferably vertically corrugated and converge downwardly, thus making the air passages or spaces between them, and the plates or walls *r* and *s* converge upwardly, as shown in Fig. 1, and the openings *t* are preferably formed in the upper ends of the inwardly-projecting corrugations. The end sections *n* are fitted between and project over the ends of the side sections *o o'*, holding them in place.

The plates *f* and *r* of the range are provided next to the fire-chamber, as shown, with the usual openings, doors, and dampers.

With our improved construction and arrangement of parts a part of the air admitted through the usual draft-openings into the lower part of the fire-chamber passes through the grate and bed of fuel thereon in the usual way, while a part passes upwardly, as indicated by arrows on Fig. 1, through the spaces

between the front and back fire-pot sections *o* and *o'* and the adjacent walls or plates *r* and *s* of the fire-chamber and is discharged through the openings *t* into the fire-pot over the burning fuel. In its passage upward through these spaces the air is heated by contact with the hot sections of the fire-pot and is delivered into the fire-pot in condition to readily unite with the unconsumed particles of carbon and combustible gases escaping from the fuel in the fire-pot and to burn and completely consume them. The deposit of soot and the choking of the flues of the range are thus prevented. The burning gases and particles of carbon carried with them in their passage through the top flue *c* impart their heat to the oven, the walls of which are kept free from soot and in condition to most effectively conduct the heat to the interior of the oven. The air in its passage through the spaces outside of the fire-pot into the upper part thereof absorbing heat from the fire-pot sections prevents their being burned and warped and materially prolongs their life.

The fire-pot sections *o* and *o'* being supported entirely at their ends and upper edges, the frame usually provided in this class of ranges for carrying the grate and fire-pot sections or linings is dispensed with. The accumulation of soot, ashes, and dirt which cause the castings with which they are in contact to rapidly burn out, the trouble and annoyance caused by the burning out and warping of such frames, which have to be frequently renewed, and the clogging or obstruction of the air-passages by soot and ashes are thus avoided.

The grate-bars can be readily removed and replaced without disturbing the fire-pot sections by simply removing the cover *m* and withdrawing them, with the bearing-piece *h*, through the opening in the casting *d*. Any part of the fire-pot can also be readily removed and renewed by first withdrawing the end sections *n*, thereby leaving the front and back sections *o* and *o'* entirely free. Any ordinary warping of the fire-pot sections will not interfere with their removal or with removing and replacing the grate-bars.

Our improved construction, with the unobstructed auxiliary supply of air which it affords, is suitable for various kinds and grades of fuel and is of special advantage with soft coal, which in stoves of the usual construction and under ordinary conditions burns imperfectly and is objectionable on account of the great amount of smoke and soot it produces. By reason of the more perfect combustion effected by our improved construction more heat is obtained from a given amount of fuel, the escape and deposit of smoke and

soot are avoided, burning out and warping of the range are prevented, and the removal and renewal of the fire-pot sections and grate-bars are facilitated.

When provision for heating running water is desired, the front or back fire-pot section may be replaced by a water front or back of corresponding shape.

Various changes in minor details of construction and arrangement of parts may be made within the principle and intended scope of the invention.

We claim—

1. In a stove the combination with the walls of the fire-chamber, of grate-supporting castings attached to the end walls of said chamber, the front-end wall and casting having corresponding openings through them, a bearing-piece removably fitted in and normally closing the opening in the front-end casting, and grate-bars fitted to turn in the rear-end casting and in said bearing-piece with which they are removable through the opening in said front-end casting, substantially as described.

2. In a stove the combination with the fire-chamber, of grate-supporting castings attached to the end walls of said chamber, the front-end wall and casting having corresponding openings through them, a bearing-piece removably fitted in and normally closing the opening in the front-end casting, rocking grate-bars having trunnions at their ends fitted to turn in the rear-end casting and in said bearing-piece with which they are removable through the opening in the front-end casting, the front trunnions being provided with removable intermeshing gears and one of said trunnions being extended to receive a shaking-handle, and a removable cover having an opening through which the extended trunnion normally projects, substantially as described.

3. In a stove the combination with the walls of the fire-chamber, of grate-supporting castings attached to the end walls of said chamber, the front casting having an opening through it of sufficient size to admit of the insertion and removal of the grate therethrough, a bearing-piece removably fitted in and normally closing the opening in said front casting, and a grate supported at the ends by said rear casting and by said bearing-piece, with which it is removable through the opening in the front casting, substantially as described.

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

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CHRISTIAN M. ZWECK.

Witnesses:

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BERNARD C. ROLOFF.