

No. 885,667.

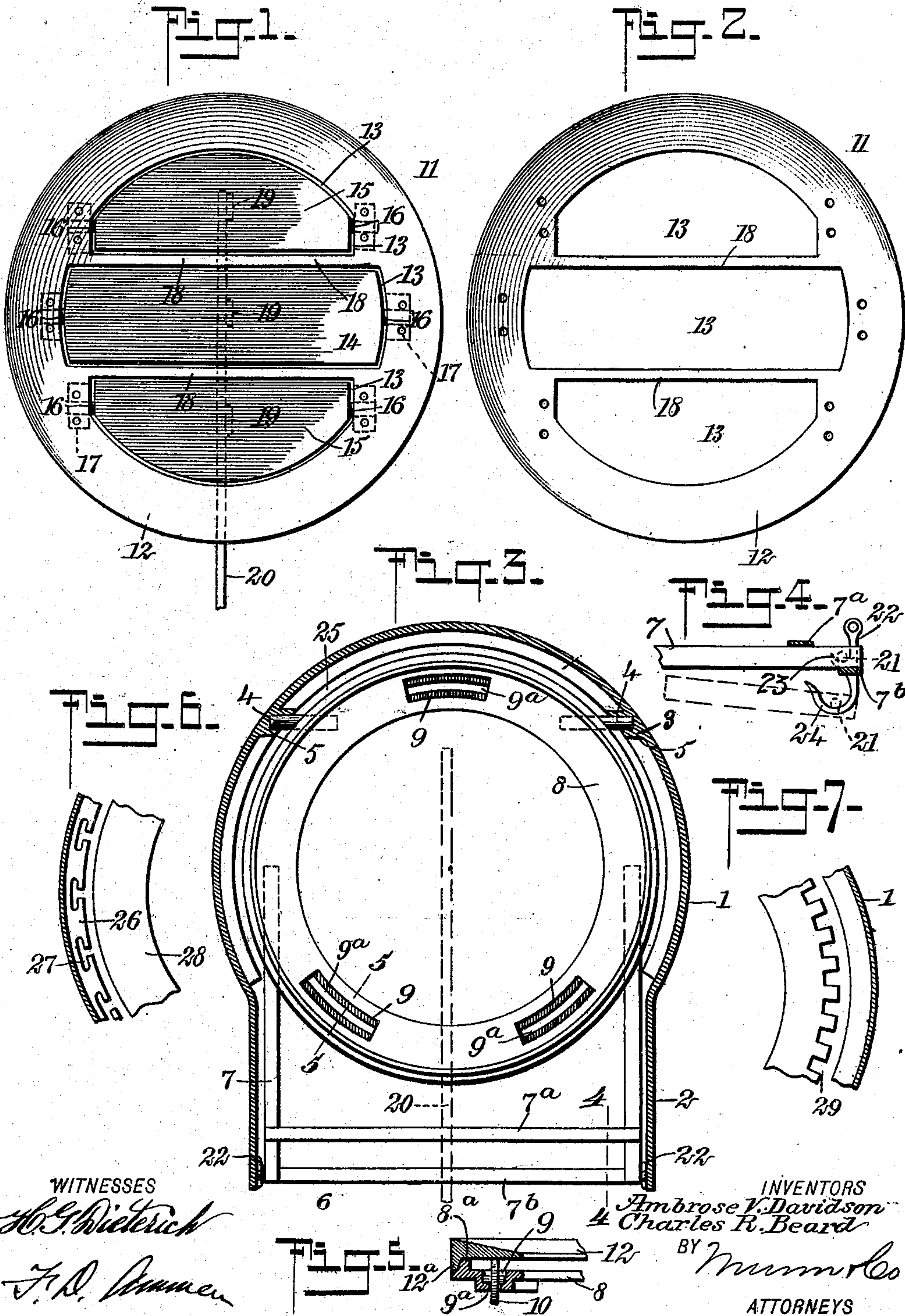
PATENTED APR. 21, 1908.

A. V. DAVIDSON & C. R. BEARD.

GRATE.

APPLICATION FILED JULY 7, 1906.

2 SHEETS—SHEET 1.



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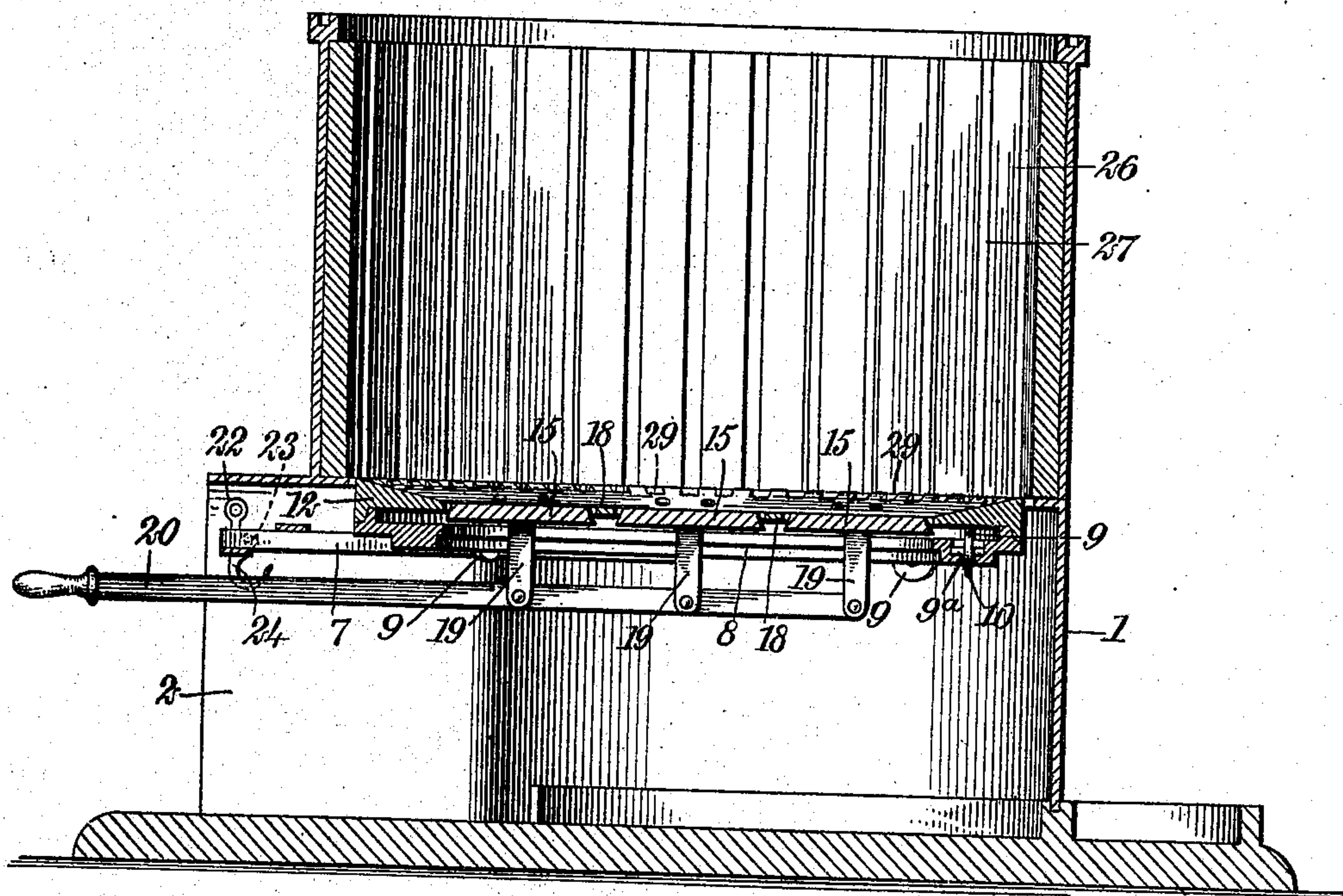
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2 SHEETS—SHEET 2.

Fig. 8



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# UNITED STATES PATENT OFFICE.

AMBROSE V. DAVIDSON AND CHARLES R. BEARD, OF AKRON, OHIO.

## GRATE.

No. 885,667.

Specification of Letters Patent.

Patented April 21, 1908.

Application filed July 7, 1906. Serial No. 325,090.

*To all whom it may concern:*

Be it known that we, AMBROSE V. DAVIDSON and CHARLES R. BEARD, both citizens of the United States, and residents of Akron, in the county of Summit and State of Ohio, have invented a new and Improved Grate, of which the following is a full, clear, and exact description.

This invention relates to stoves and furnaces, and especially to the construction of the grates thereof.

The object of the invention is to produce a grate of improved construction which will effect the combustion of the fuel principally at or above the edges thereof, to the end that the heat developed by the stove or furnace will be increased; this prevents warping of the grate.

A further object is to provide a construction which will enable the grate to be readily shaken or dumped.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan of the grate; Fig. 2 is a view similar to Fig. 1 but representing the grate-bars as removed; Fig. 3 is a horizontal cross-section through the lower portion of a stove and showing the grate-rest in plan, the grate being removed; Fig. 4 is a detail illustrating the means for supporting the forward end of the grate, being a section on the line 4—4 of Fig. 3; Fig. 5 is a cross-section on the line 5—5 of Fig. 3; Fig. 6 is a horizontal cross-section through a portion of the wall of the stove and showing a construction thereof which gives an increased air supply, and Fig. 7 is a view similar to Fig. 6 and showing another arrangement for the same purpose. Fig. 8 is a vertical section through the lower portion of a stove having a grate constructed according to my invention.

Referring more particularly to the parts 1 represents the body of the stove or furnace formed forwardly into a charging mouth 2. Within the stove a grate-rest 3 is provided, the body of which has the form of a ring 8. At its rear portion the grate-rest 3 is provided with outwardly projecting gudgeons 4 which aline with each other and which are rotatably supported in sockets 5 projecting

inwardly from the stove-wall as indicated. From the forward side of the ring 8 a guide frame 6 projects outwardly into the discharging mouth 2, and this frame comprises side bars 7 connected by guide bars 7<sup>a</sup> and 7<sup>b</sup>. These guide bars are arranged as shown in Fig. 4, one being above and one below the bars 7, so that a space is formed therebetween, for guiding a shaker lever to be described hereinafter.

On the upper side of the ring 8 curved sockets 9 are formed to receive friction rollers 10 having gudgeons rolling in the sockets 9 as shown, the bodies of the rollers lying in slots 9<sup>a</sup> formed in the ring at the sockets as shown. The upper edges of the rollers project above the ring 8 and support a grate 11. The construction of this grate is shown most clearly in Figs. 3 and 4; it comprises a ring 12 which rests upon the rollers 10; it is formed with grate bar openings 13. These are preferably three in number, as shown, comprising a centrally disposed main grate bar 14 and side grate bars 15. These grate bars are provided on their extremities with gudgeons 16 which are rotatably mounted on the underside of the ring by means of suitable bearing clips 17. Between the openings 13 the ring 11 comprises transverse bars 18 which are integral with the ring or body of the grate.

Upon the under sides of the grate bars 14 and 15, preferably near their middle portions, downwardly projecting lugs 19 are formed and these lugs attach pivotally to a shaker lever 20, the forward extremity whereof extends through the space between the guide bars 7<sup>a</sup> and 7<sup>b</sup> projecting at the front of the stove in the usual manner. The upper face of the ring-shaped body 12 of the grate preferably inclines slightly toward the central portion thereof, as indicated in Fig. 5, so that the inner edge of the annular body is disposed flush with the upper surfaces of the grate bars.

In order to center the grate 11 upon the grate-rest the lower side of the ring 12 is formed with a downwardly projecting flange 12<sup>a</sup> which comes against an upwardly projecting annular rib 8<sup>a</sup> formed on the grate-rest ring 8.

At its forward end the guide frame 6 is provided on each side with an outwardly projecting pin 21. Opposite these pins on the side of the charging mouth hangers 22 are pivoted. These hangers depend from their pivots as shown. Each hanger is formed



with two horns 23, 24 constituting hooks, either of which may engage the pin 21. The forward end of the grate-rest is supported normally on the upper hooks 23 in the manner indicated in full lines in Fig. 4.

If it is desired to draw the fire-bed, the hangers will be disengaged from the upper hooks and supported upon the lower hooks in such position as indicated in the dotted lines in Fig. 4. The grate will then incline downwardly toward the charging mouth so that the fire-bed may be conveniently raked.

As the grate bars substantially fill the grate openings, and as the grate and grate bars are imperforate, it follows that the principal portion of the air for combustion comes up in the annular space 25 between the grate and the wall of the stove, as indicated in Fig. 3. In this way the fuel combustion takes place principally around the outside of the fire-bed where it gives the greatest heating effect to the surrounding air. By this means we avoid developing a great and useless heat around the center of the grate which produces warping of the grate and gives little heating effect to the surrounding air.

Where an increased amount of air for combustion is desired, we may provide an arrangement such as that shown in Fig. 6 wherein the stove-lining 26 is provided with air ducts 27, thus increasing the area around the edge of the grate 28.

In Fig. 7 another form is shown in which the edge of the grate is formed with notches 29, which have the same effect of increasing the area.

The grate may be shaken so as to dislodge the ashes around the edge of the fire-bed, by reciprocating the shaker bar 20 in a horizontal plane. In this connection it should be understood that the ring rolls back and forth upon the roller 10. When it is desired to loosen up the body of the fire-bed, this may be accomplished by reciprocating the shaker bar longitudinally. In doing this, the grate bars rock upon their gudgeons 16 as axes of rotation. In this way the condition of the fire may be very nicely controlled and, furthermore, the grate readily rids itself of ashes and clinkers.

Having thus described our invention, we claim as new and desire to secure by Letters Patent:

1. A stove having an imperforate grate mounted therein having openings for grate-bars, grate-bars mounted to rock in said openings and substantially filling said openings whereby an upward draft through said grate is prevented, said stove having draft openings from below around the edge of said

grate whereby the consumption of fuel takes place near the periphery.

2. A stove having a body with an outwardly projecting discharging mouth, a grate-rest pivotally supported at the rear side of said body and having a guide frame projecting into said discharging mouth, hangers pendent pivotally in the forward portion of said body having two hooked horns to engage under said guide frame to hold said grate rest level or depressed forwardly, a grate rotatably supported on said grate rest, and a shaker rod attached to said grate and guided on said guide frame.

3. A stove having a body with a discharging mouth projecting therefrom, a grate rest mounted in said body at the rear thereof, and having a frame projecting into said mouth, means for supporting said frame in a depressed position to incline the grate, a grate rotatably mounted upon said grate rest, grate bars mounted transversely with respect to said mouth and adapted to rock in said grate, a shaker lever pivotally attached to said grate bars for rocking the same projecting through said mouth, affording means for rocking said grate bars by a longitudinal movement, and affording means for shaking said grate on the pivot point thereof.

4. A stove having a body with an outwardly projecting discharging mouth, a grate-rest having a ring-shaped body pivotally supported in said stove body, and having a guide frame projecting forwardly into said discharging mouth, a grate rotatably mounted on said grate-rest and having openings therein, plates mounted to rock on said grate-rest and normally closing said openings, a shaker-bar pivotally attached to said plates and projecting out through said discharging mouth, and hooks attached in said discharging mouth and engaging said guide frame to hold the same in an elevated or a depressed position.

5. A stove of cylindrical form at the grate level having an imperforate grate-ring of less diameter than said stove whereby draft space is formed beyond the edge of said grate-ring, said grate-ring having openings for grate bars, and imperforate grate bars mounted in said openings and stopping the draft there-through.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

AMBROSE V. DAVIDSON.

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Witnesses:

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FRED J. STEINERT.