

R. HILPRECHT.

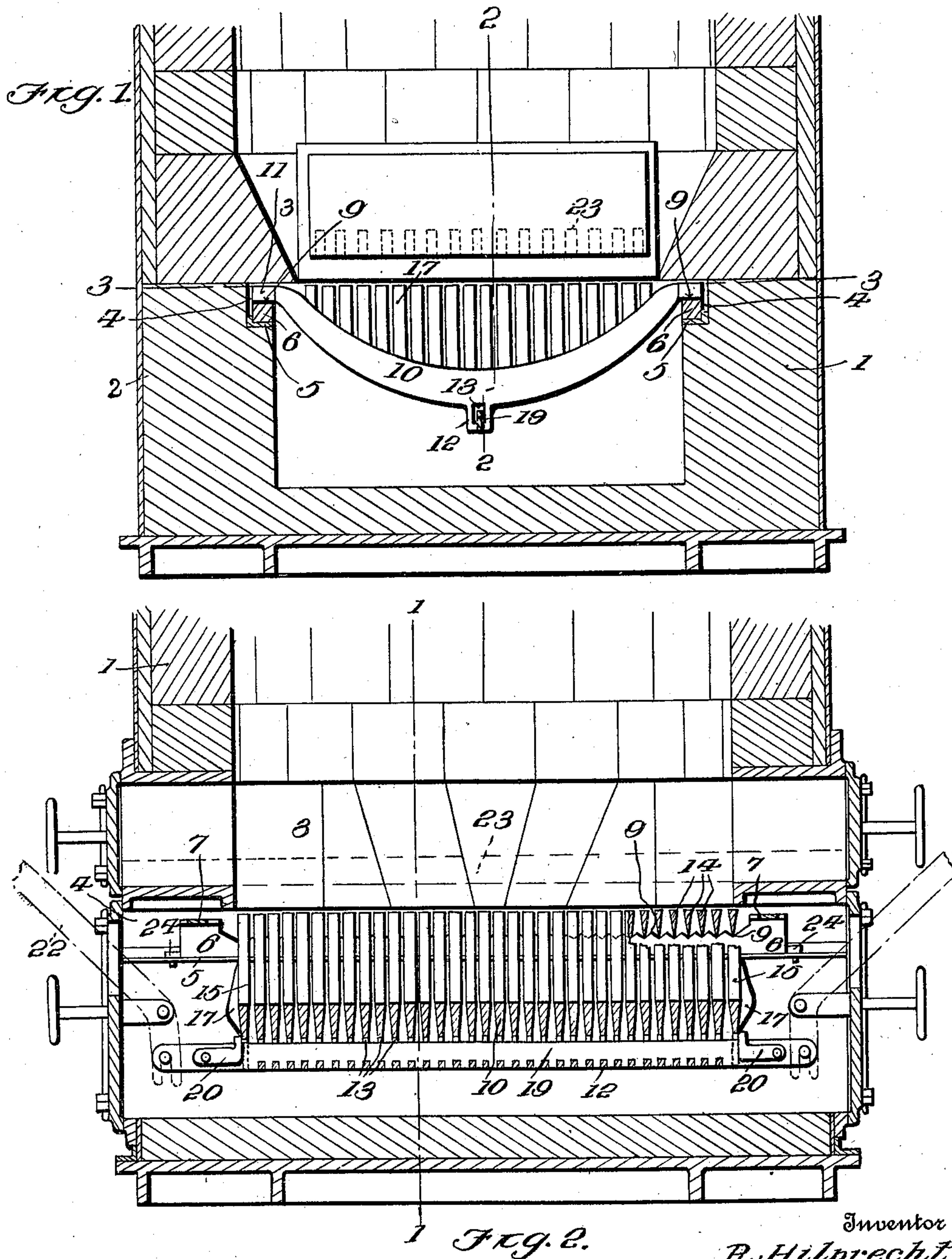
GRATE.

APPLICATION FILED JUNE 13, 1910.

Patented Feb. 7, 1911.

2 SHEETS—SHEET 1.

983,716.



Inventor

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Witnesses

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H. H. Murray.

By

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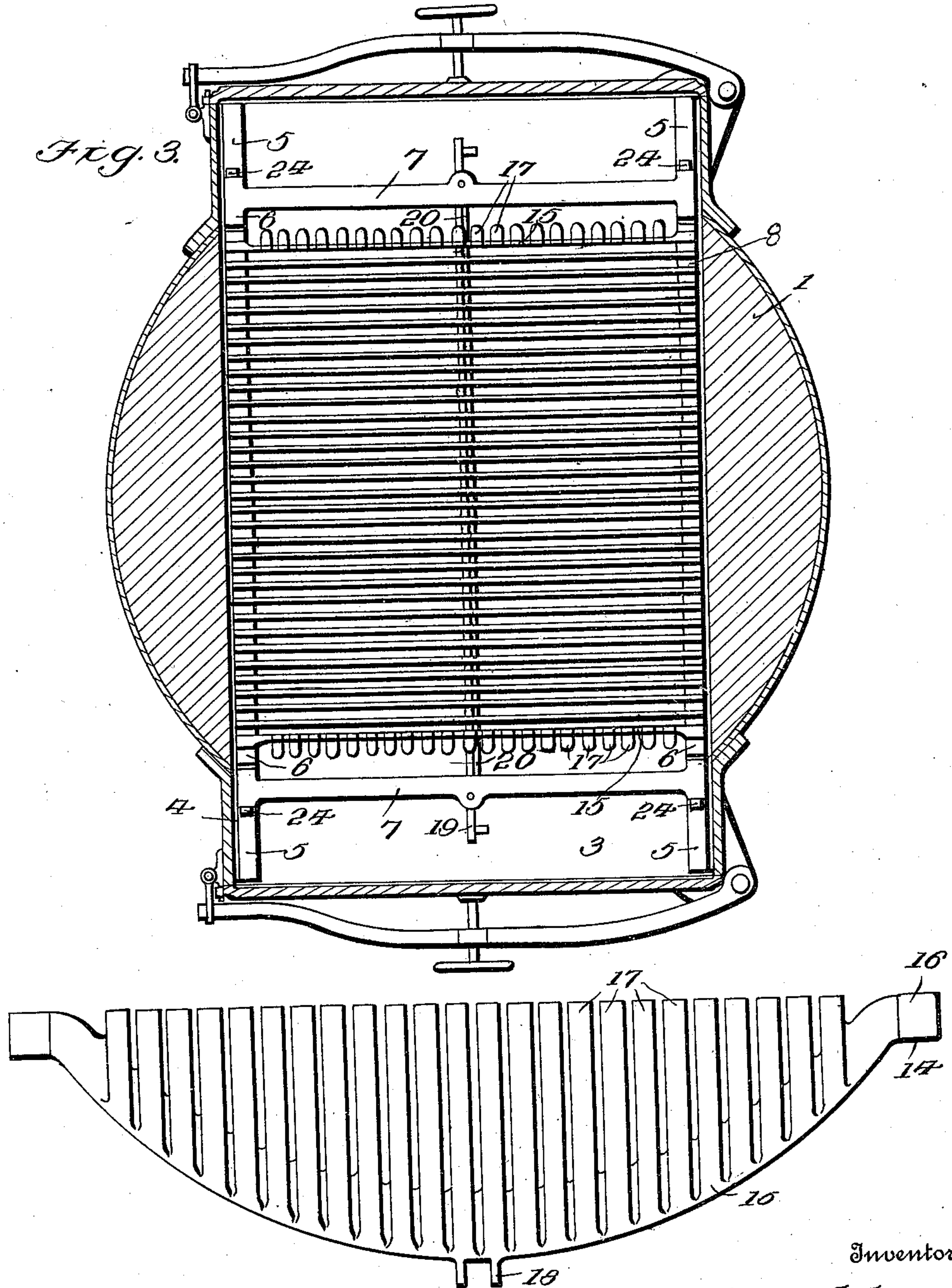
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Fig. 4.

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UNITED STATES PATENT OFFICE.

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GRATE.

983,716.

Specification of Letters Patent.

Patented Feb. 7, 1911.

Application filed June 13, 1910. Serial No. 566,598.

To all whom it may concern:

Be it known that I, ROBERT HILPRECHT, a subject of the Emperor of Germany, residing at Lansing, in the county of Ingham and State of Michigan, have invented certain new and useful Improvements in Grates; and I do hereby 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

The invention relates to an improvement in grates for furnaces and the like, and is more particularly directed to a grate of the swinging basket type in which the various parts may be readily and conveniently renewed, and in which the grate, while possessing all the desirable characteristics of grates of this type, may be readily removed from the furnace at any time as an entirety.

The main object of the present invention is the production of a grate constructed to include essentially a frame comprising the grate support which frame with the grate proper mounted thereon may be readily placed in or removed from the furnace as an entirety; the grate proper including a series of grate bars each independently and movably supported on the frame, and grate end sections movably supported on the frame and formed to provide the inclosures for the grate; a shaker bar cooperating with the grate bars and end sections to properly space said bars with relation to each other and cause their simultaneous movement for shaking purposes, the end sections being separable from the shaker bars to permit access to the interior of the grate at pleasure.

The invention in its preferred details of construction, will be described in the following specification, reference being had particularly to the accompanying drawings, in which:—

Figure 1 is a transverse sectional view on the line 1—1, Fig. 2. Fig. 2 is a section on the line 2—2, Fig. 1. Fig. 3 is a horizontal section on the line 3—3, Fig. 1. Fig. 4 is a detail view of one of the end sections of the grate.

Referring particularly to the accompanying drawings, wherein is illustrated the pre-

ferred details of construction, my improved grate is shown in use with a furnace 1, the illustration of which is designed to represent any special or desired type of furnace, as the specific construction of the same, aside from the details hereinafter noted, are immaterial so far as the present invention is concerned.

In constructing a furnace for the reception of the improved grate the walls 2 of the fire box 3 are formed in their upper inner edges with channels 4, in which channels are secured tracks 5 preferably of L-shape angle irons, as shown. The supporting frame for the grate comprises bars 6, forming the side bars of the frame and connected at their ends by cross bars 7, thereby providing a rectangular frame with the side bars so spaced that they will, in use, cooperate with the respective tracks 5. Intermediate the ends and for the greater portion of their lengths the side bars 6 are reduced in height to provide bearing portions 8, and the upper edges of said bearing portions are formed with a series of regularly spaced angular depressions 9 to provide seats for the grate bars, as will presently appear. Any desired number of seats may be formed in the bearing portions of the side bars, the number being determined by the desired spacing between the grate bars.

The grate bars comprise arcuate strips 10 formed at the ends to provide laterally extending bearing blocks 11, the latter, when the grate bars are applied, engaging the respective side bars with the arcuate portions 10 curving downwardly from each of said blocks to the longitudinal center. At the longitudinal center, or point of greatest depth of the bars, they are each provided with a depending section 12 centrally formed with a rectangular aperture 13 having its maximum dimension transverse the length of the bar. In transverse section the arcuate portions of the grate bars 10 have their greatest width on the upper edge and the minimum width on the lower edge, so that the sides of each bar incline slightly toward each other from the top edge of the bar to the lower edge. The vertical sectional formation of the bearing blocks of approximately triangular shape having the base or portion of maximum width on the upper edge, so that the apex or lower edge of the block forms in effect knife edges 14 to rest

in the respective depressions 9 in the side bars to provide for movably supporting said grate bars.

The end sections, or final grate bars 15 at the respective ends of the grate are practically duplicates of the grate bars 10, that is include sections of arcuate shape having the end bearing blocks 16 formed to cooperate with the end depressions in the side bars of the frame. The end grate bars, however, are designed to form closures for the ends of the basket grate for which purpose they are formed throughout their arcuate lengths with vertically extending spaced fingers 17, terminating at their upper ends on a line with the upper edges of the bearing block 16. The end bars of the grate are centrally formed with depending sections 18 including spaced lugs having a distance between them corresponding to the transverse dimension of the openings 13 in the depending sections 12 from the main grate bars.

In applied positions the intermediate grate bars, in the desired number, are arranged with their bearing blocks engaging the respective depressions in the side bars of the frame, the end bars or sections 15 engaging the end depressions in said side bars. The construction thus provided forms a basket grate having a curved bottom with the ends closed by the fingers 17 of the end bars. A shaker bar 19 is then applied to all of the grate bars, said shaker bar comprising an elongated strip of greater length than the similar dimension of the grate and of a width to pass through the openings 13 in the grate bars. The height of the shaker bar is materially less than the similar dimensions of the openings 13, and the lower edge of said grate bar is formed at regular angles with depending stud like projections 20 designed when the shaker bar is applied to fit between the proximate surfaces of the depending sections of the grate bars and so maintain said bars spaced a proper distance apart throughout their lengths. The combined vertical dimensions of the shaker bar and studs is less than the similar dimensions of the openings 13, so that said bar may be passed longitudinally through said openings when the grate bars are in place and properly fitted between said bars by lowering the shaker bar in an obvious manner. It will be noted that the lugs 18 of the end bars partly embrace the shaker bar, and to secure them in desired relation to the shaker bar, I provide said bar with gravity latches 20 designed to engage the outer surfaces of the end bars when the latter are in place, as will be noted from the drawings. This construction permits convenient freeing of either end bar from the shaker bar at the pleasure of the user to permit said end bar to be turned upwardly to provide access to the interior of the grate for the removal

of clinkers or the like. Either end of the shaker bar may be removably connected to a lever 22 or other appropriate device for causing an endwise movement of the said bar and thereby a simultaneous swinging of the grate bars on their bearings to cause a shaking movement of the grate for the usual purposes.

As previously described, it is to be noted that the grate as an entirety is supported on the frame including the bars 6 and 7, and that this frame is slidably mounted on the tracks 5 in the furnace. It is therefore obvious that when desired the grate as an entirety may be moved from the furnace by causing the endwise movement of the supporting frame on the track, the furnace being preferably provided at the end of the fire box or pit with doors through which the grate may be drawn when desired. In withdrawing the grate for renewal or repair during the operation of the furnace, I prefer to utilize auxiliary grate bars 23 which may be forced through the fire bed immediately above the grate proper to support the body of coals while the grate is being withdrawn, repaired and replaced.

The improved grate comprises separable sections which may be readily removed from the grate structure for repair or renewal, and as a whole is so mounted with relation to the furnace that it may be conveniently removed as an entirety without interfering in any way with the operation of the furnace. If desired, stop locks 24 may be removably secured to the track beyond the respective ends of the supporting frame to secure the latter in applied position.

Having thus described the invention, what is claimed as new, is:—

1. A grate including a supporting frame having side bars formed with angular depressions, grate bars having bearing blocks formed to provide knife edges to engage the depressions in the side bars, the end bars of the grate having vertically projecting closing sections, and a shaker bar cooperating with the respective grate bars to insure their simultaneous movement in shaking.

2. A grate including a supporting frame having side bars formed with angular depressions, grate bars having bearing blocks formed to provide knife edges to engage the depressions in the side bars, the end bars of the grate having vertically projecting closing sections, and a shaker bar cooperating with the respective grate bars to insure their simultaneous movement in shaking, the end bars being separable from the shaker bar to permit access to the interior of the grate.

3. A grate including a supporting frame having side bars formed with angular depressions, grate bars having bearing blocks

formed to provide knife edges to engage the
depressions in the side bars, the end bars
of the grate having vertically projecting
closing sections, a shaker bar cooperating
5 with the respective grate bars to insure their
simultaneous movement in shaking, the end
bars being separable from the shaker to
permit access to the interior of the grate,
and means carried by the shaker bar to nor-
mally secure the end bars against separation
therefrom.

4. A grate including a supporting frame
mounted for bodily movement in the fire
box, the side bars of said frame being
15 formed with angular depressions, independ-
ent arcuate-shaped grate bars supported in
said depressions for rocking movement, fin-
gers projecting vertically from the respec-
tive end bars of the grate and terminating

at their upper line approximately on a level 20
with the highest point of the grate bars, a
shaker bar formed for interlocking connec-
tion with the intermediate grate bars and
with loose connection with the end grate
bars, the interlocking connection between 25
the shaker bar and intermediate grate bars
serving to space the latter with relation to
each other, and means carried by the shaker
bar to interlock said bar with the end grate
bars. 30

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

ROBERT HILPRECHT.

Witnesses:

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