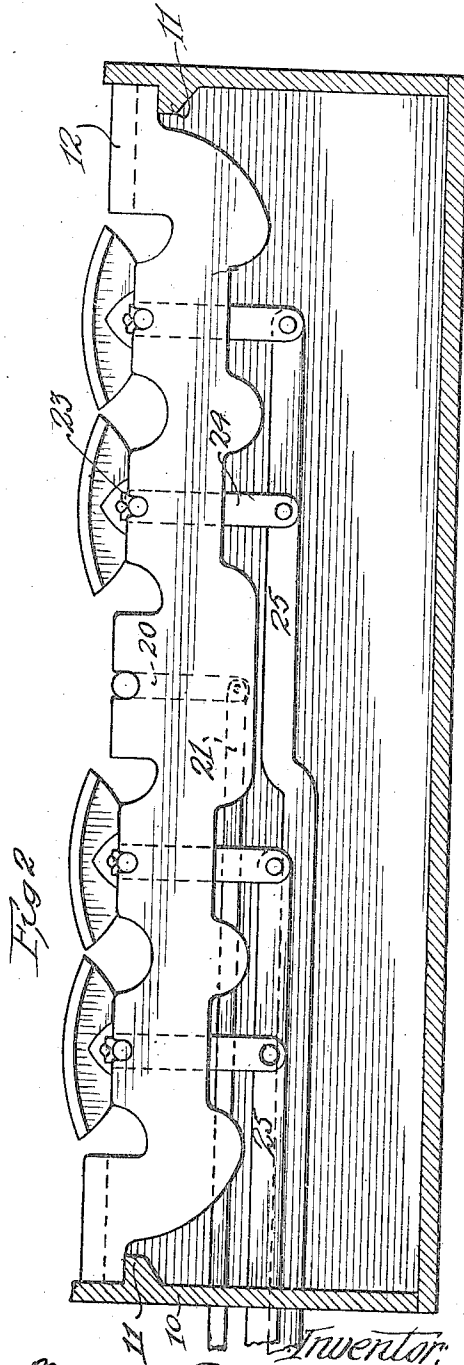
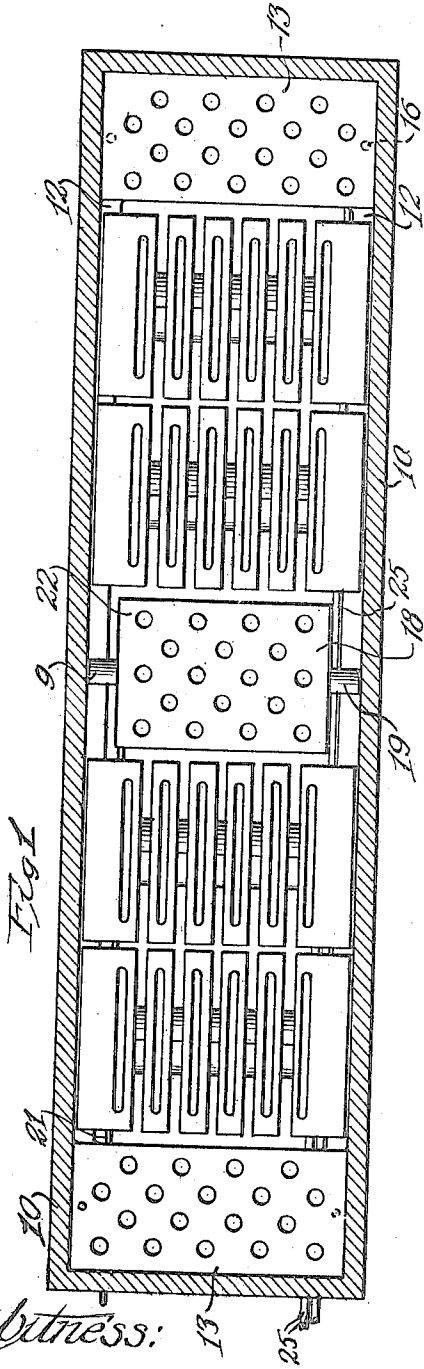


M. E. HANSELL.
 GRATE BAR.
 APPLICATION FILED DEC. 16, 1915.

1,207,751.

Patented Dec. 12, 1916.
 2 SHEETS—SHEET 1.



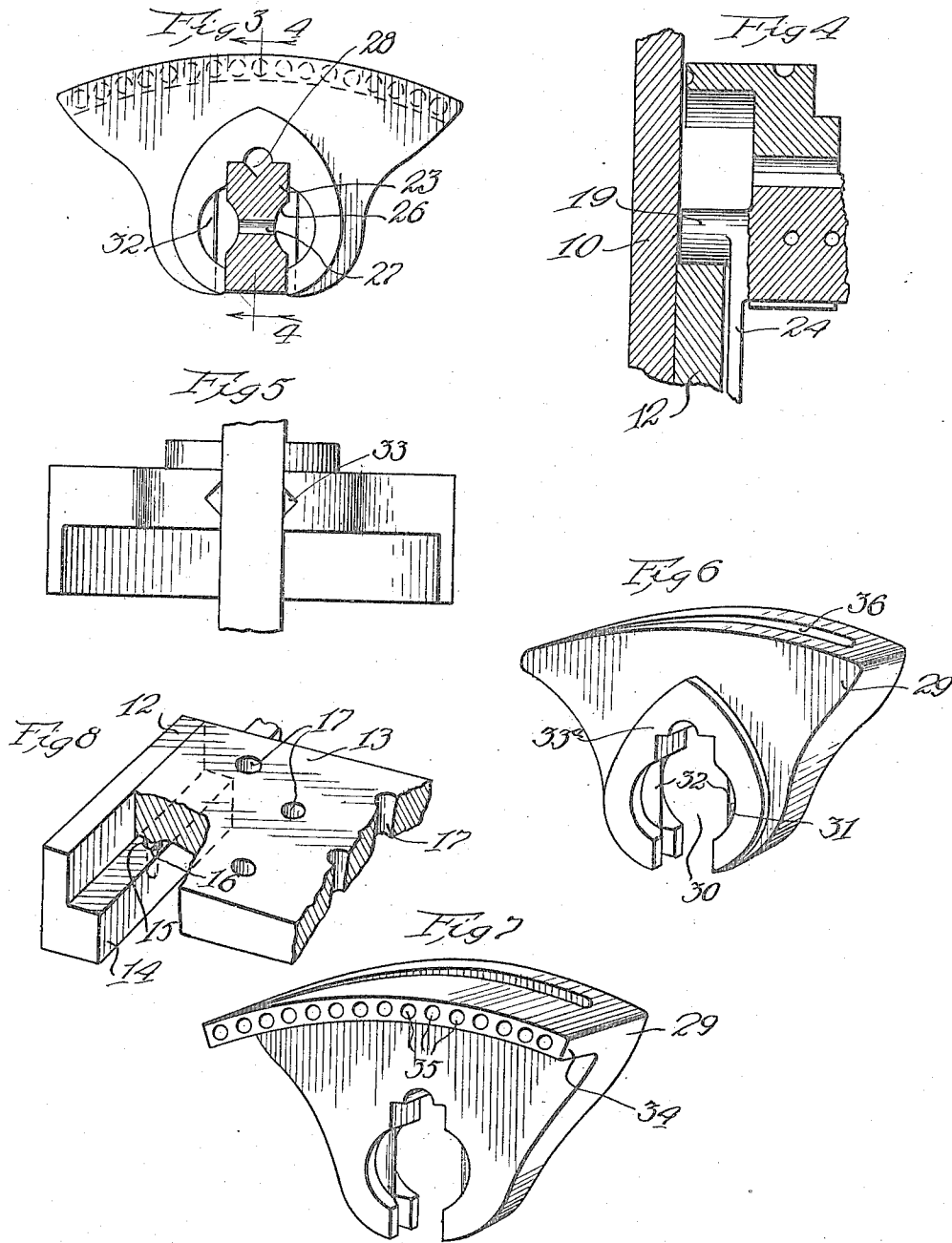
Witness:
 Geo. D. Main.

Inventor:
 Marcus E. Hansell,
 By Brown Nissel Sprinkle Atty.

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Witness:
 Leo P. Harris.

Inventor:
 Marcus E. Hansell,
 By Brown Messers & Pinkney

UNITED STATES PATENT OFFICE.

MARCUS E. HANSELL, OF ANAMOSA, IOWA, ASSIGNOR OF ONE-HALF TO GUSTAVUS A. SMITH, OF MARSHALLTOWN, IOWA.

GRATE-BAR.

1,207,751.

Specification of Letters Patent.

Patented Dec. 12, 1916.

Application filed December 16, 1915. Serial No. 67,127.

To all whom it may concern:

Be it known that I, MARCUS E. HANSELL, a citizen of the United States, residing in Anamosa, in the county of Jones and State of Iowa, have invented certain new and useful Improvements in Grate-Bars, of which the following is a specification.

My invention relates to grate bars, and has for its object the provision of a simple and efficient device of this character which may be easily and readily placed in position for use, and one which may be easily and quickly repaired when necessary.

Other objects will appear hereinafter.

An embodiment of my invention is illustrated in the accompanying drawings forming part of this specification and in which—

Figure 1 is a section taken through a firebox showing my improved grate in plan view. Fig. 2 is a vertical section taken through the firebox showing a side elevation of my improved grate. Fig. 3 is a section through one of the supporting bars in the grate showing a grate finger in side elevation. Fig. 4 is a section taken on line 4—4 in Fig. 3. Fig. 5 is a bottom view of the parts shown in Fig. 3. Fig. 6 is a perspective view of one of the grate fingers used intermediate the ends of the grate bars. Fig. 7 is a perspective view of a grate finger used at the ends of the grate bars; and Fig. 8 is an enlarged fragmental view showing the connection between one of the side bars and end plates of the grate frame, with portions broken away to show the connection between the parts.

My invention is adapted for use wherever grates are necessary. It is particularly adaptable for furnaces for producing steam or where great heats are required, and economy in fuel is desired. I have shown the grate as being general rectangular, but other shapes may be provided whenever desired.

Referring more particularly to the drawings, a furnace wall 10 is indicated as inclosing the grate. On the front and rear of the upright walls 10 are provided the usual ledges 11 which support the grate bars. These may be formed integrally, as shown, or in any other manner desired. At the sides of the furnace walls I provide side bars 12 which have portions resting on the ledges 11

to support them. There are preferably two side bars 12, one at each side of the grate. The ends of the side bars 12 are spaced apart by end plates 13. The side bars are provided with ledges 14 near each end on adjacent sides thereof. Upon these ledges rest the ends of the end plates 13. Each ledge 14 is provided with a perforation 15 and in each perforation 15 is a projection or pin 16 which is carried by one end plate 13. The projections or pins 16 are slightly smaller in diameter than the perforations 15, so that slight movement may be had between the side bars 12 and the end plates 13. This difference in the size of these parts also provides means whereby expansion and contraction will not damage the frame. The bars 12 and end plates 13 form the frame for the grate. The end plates 13 each have the further function of providing stationary grate bars for the front and rear ends of the grates. The end bars 13 are preferably provided with openings 17 extending there-through which provide means for furnishing air to the fire immediately over the plates, and for providing means for preventing overheating of the plates.

At the central portion of the grate, or when so desired at any other portion, I provide a grate bar which comprises a plate 18 having trunnions 19 near its median center line, which are journaled in the side bars 12. The plate 18 is provided with an arm 20 extending downwardly, and the arm 20 is connected with a bar 21 which extends outwardly through the furnace wall 10 to provide means for oscillating the plate 18. The plate 18 is provided with perforations 22 for the purpose of furnishing air to the fire immediately above the plate and also for preventing overheating of the plate.

Between the plate 18 and each end plate 13, I provide one or more grate bars which are made up of parts. The preferable construction is a bar 23 which extends across the space between the side bars 12 and is journaled at its ends in the side bars. Each of the bars 23 is provided with a downwardly extending arm 24 and the arms are connected in two sets by connecting links 25 which extends through the front wall 10 of the furnace and provide means for oscillating the bars 23 and also for holding them in de-

sired positions. The bars 23 are alike in form and construction and a description of one will suffice for all. The bar 23 is provided with longitudinal grooves 26 on its vertical edges and with perforations 27 which extend laterally therethrough, terminating in the grooves 26. At the top of the bar 23 is a longitudinal groove 28.

On each bar 23 is mounted a plurality of grate fingers 29 which are adapted to cover the entire upper and lateral sides of the bars. Each grate finger 29 is provided with a notch 30 at its lower edge adapted to fit a bar 23. The grate fingers are each provided with grooves 31 in the sides of notches 30 opposite the grooves 26 and 28 of the bar 23 on which it rests. The function of the grooves 31, 28 and 26 is to provide means whereby air may pass between the grate fingers 29 and the bars 23 to prevent overheating of such parts. In order to direct the currents of air passing through the grooves 26, 28 and 31 more closely to the bars 23, I provide deflecting plates 32 at the side grooves 31 of the grate fingers. These plates 32 extend a short distance toward the bars 23 and upon air passing over such plates it is deflected toward the bars 23, thereby facilitating the cooling of said bars. The grate fingers are further provided with vertically extending grooves 33 in the vertical sides of the notches 30 which provide means for air entering the grooves 26, 28 and 31. Each grate finger 29 is provided with a boss 33^a at one side thereof which is adapted to space the grate fingers slightly apart in order to permit the passage of air between such grate fingers upwardly to the fire thereon. At the ends of each of the bars 23 the last grate finger 29 is provided with a lip 34 which extends outwardly over the side rail 12 protecting the latter from the fire on the grate fingers. In order to prevent overheating of the lips 34, I provide recesses 35 in the outer edge thereof so as to increase the heat-radiating surfaces of said lips. In the top edge of each grate finger I provide a groove 36 which is adapted to hold a quantity of ashes when in use and prevent the fuel resting thereon from adhering to and burning the tops of the grate fingers. I have shown the grooves 36 as one continuous groove reaching across the top of each grate finger, but these grooves may be varied in length and number according to different requirements or desires.

While I have illustrated and described the preferred form of my construction, I do not desire to be limited to the precise details set forth, but desire to avail myself of such variations and changes as come within the scope of the appended claims.

I claim:

1. A grate comprising two substantially parallel side bars, each bar having a ledge at each of its ends extending toward the other side bar, and each ledge having a vertical perforation therein; perforated end plates resting on the ledges and connecting the side bars; vertical pins on the end plates smaller than and disposed in said perforations providing play in the connections between the side bars and end plates; a wide perforated plate pivotally mounted in and intermediate the ends of the side bars; grate bars pivotally mounted in the frame at each side of said central plate; manually operable means for controlling oscillations of the grate bars; and manually operable means independent of the first-mentioned means for controlling the movement of the central grate plate.

2. In combination, a grate frame; bars extending across and journaled in the grate frame; grate fingers each having a notch in its lower edge engaging one of said bars, there being grooves in the grate fingers in the sides of said notches, providing ventilating openings between the grate fingers and said bars; and deflecting plates in certain of the grooves of the grate fingers adapted to direct currents of air passing through said grooves toward said bars.

3. In combination, a grate frame; bars extending across and journaled in the grate frame; grate fingers each having a notch in its lower edge engaging one of said bars, there being ventilating grooves between the sides of the notches and said bars extending substantially parallel with the latter, and vertical ventilating grooves in the sides of the notches opening into the first mentioned ventilating grooves; and deflecting members in the first mentioned grooves at the upper ends of the vertical grooves adapted to direct air toward said bars.

4. In combination, a grate frame provided with side rails; bars extending across and journaled in the side rails; grate fingers each having a notch in its lower edge engaging one of said bars; and projecting lips on certain of the grate fingers extending over and protecting the side rails from heat, there being a plurality of spaced recesses in the edges of said lips adapted to increase the radiating surfaces of the grate fingers.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 7th day of December, A. D. 1915.

MARCUS E. HANSELL.

Witnesses:

A. C. PEET,
JACOB BISH.