

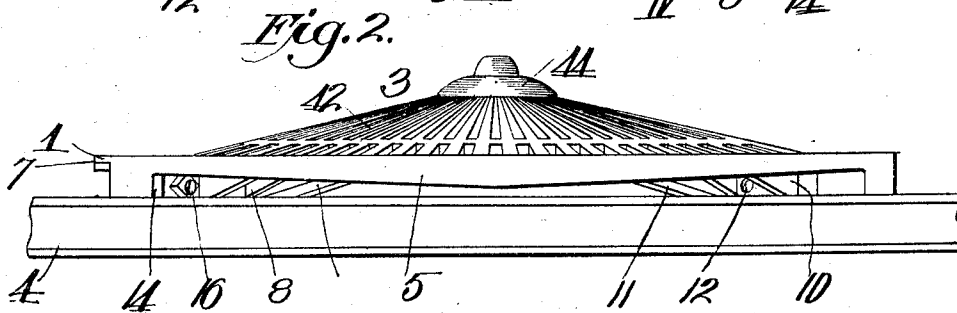
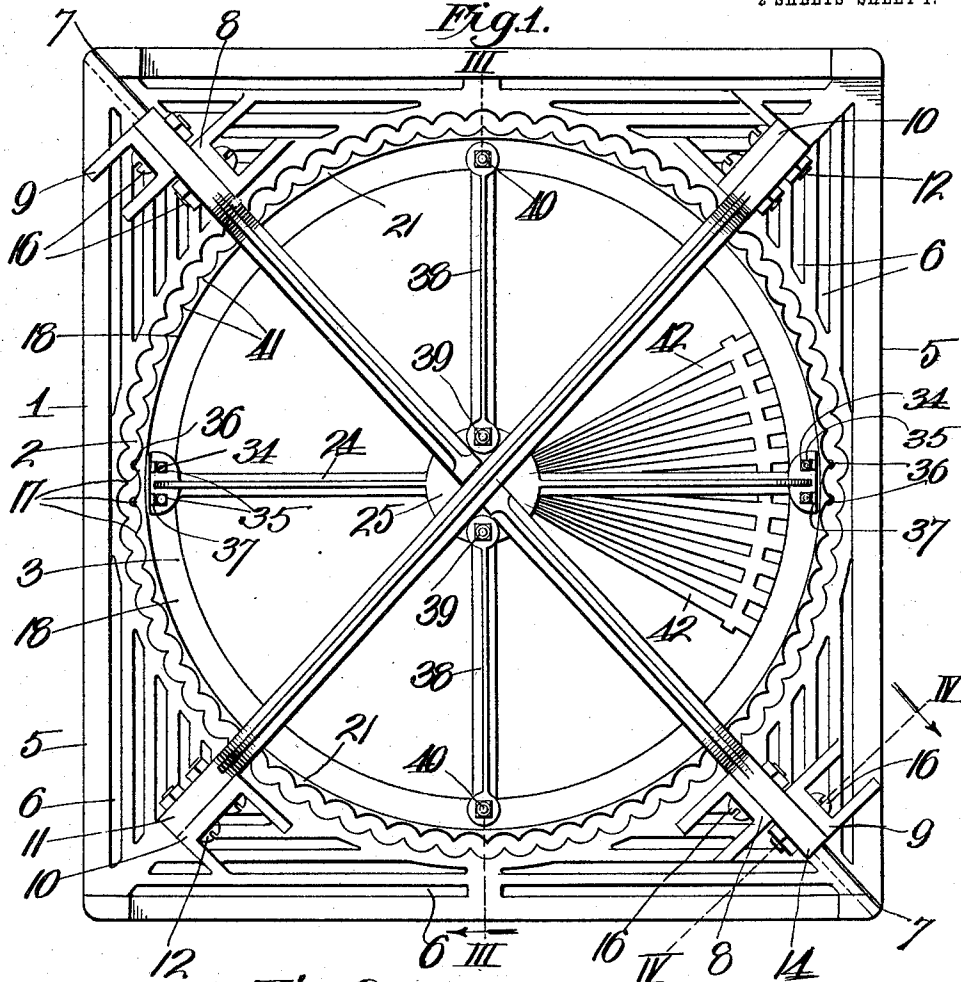
T. W. NICOL.
GRATE.

APPLICATION FILED MAR. 27, 1911.

1,030,528.

Patented June 25, 1912.

2 SHEETS-SHEET 1.



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2 SHEETS-SHEET 2.

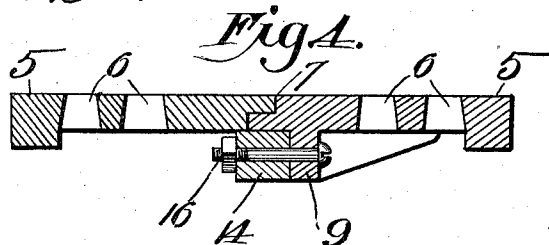
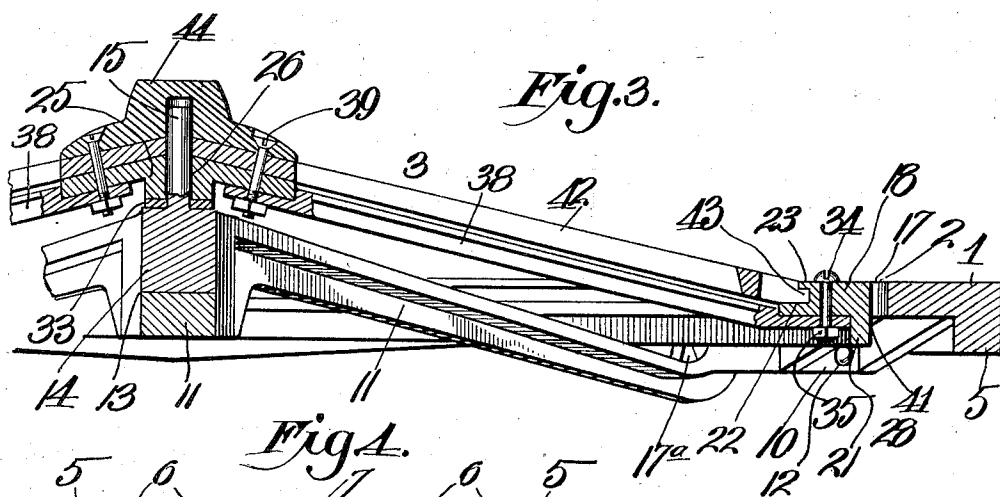


Fig. 7.

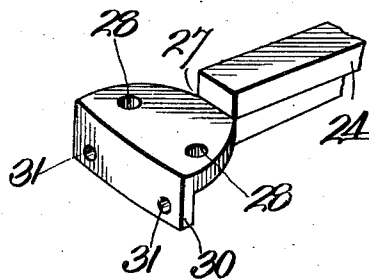


Fig. 5.

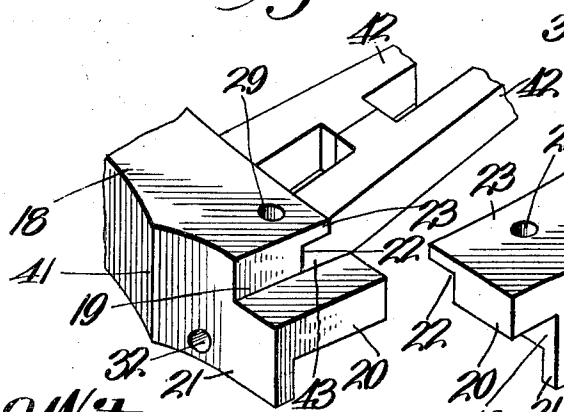
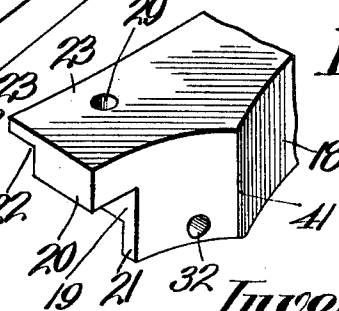


Fig. 6.



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UNITED STATES PATENT OFFICE.

THOMAS W. NICOL, OF KANSAS CITY, MISSOURI.

GRATE.

1,030,528.

Specification of Letters Patent.

Patented June 25, 1912.

Application filed March 27, 1911. Serial No. 617,283.

To all whom it may concern:

Be it known that I, THOMAS W. NICOL, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Grates, of which the following is a specification.

This invention relates to grates for boiler furnaces, hot air furnaces and the like, and has for its object the production of an efficient grate composed of sections of such construction that they can be readily assembled or separated within the combustion chamber of the furnace.

With this general object in view the invention consists in certain novel and peculiar features of construction and organization as hereinafter described and claimed and in order that it may be fully understood reference is to be had to the accompanying drawings, in which—

Figure 1, is an inverted plan view of a grate embodying my invention. Fig. 2, is a front view of the grate in upright position and also shows a support therefor. Fig. 3, is an enlarged central vertical section of the grate, on the line III—III of Fig. 1. Fig. 4, is a section on the line IV—IV of Fig. 1. Fig. 5, is an enlarged perspective view of a part of one of the sections of the inner member and also shows a pair of abutting segments of the crown of the grate. Fig. 6, is a perspective view of a part of the other section of the inner member. Fig. 7, is a perspective view of one end of a grate bar for securing the semicircular sections of the inner member together.

The grate consists of the outer member 1 ordinarily rectangular in contour and provided with a circular opening 2, and the inner circular member 3, arranged within the opening of the outer member and adapted to be oscillated in a horizontal plane. The outer member of the grate is adapted to be arranged within a furnace, not shown, and consists of two triangular sections 5 abutting together at their hypotenuse edges, as shown clearly in Fig. 1, and each of said sections is provided with the customary slots 6, through which air may pass upwardly and ashes fall. At their abutting edges the sections are step-jointed together as at 7, and near said edges they are provided with depending braced lugs 8 and 9, the lugs 9 being disposed nearer the corners of

the sections than the lugs 8, so that when the sections are fitted together the adjacent lugs 8 and 9 will be offset with respect to each other as shown in Fig. 1. Each section near its opposite corner is also provided with a similar lug 10. Arranged under the outer member and extending diagonally thereof below its axial center is a cross bar 11 fitting at opposite sides with its ends against lugs 10, and bolted thereto at 12 and said bar is provided midway its length with a recess 13, in its upper edge.

Part 14 is a bar extending diagonally across the outer member at its under side in the plane of the abutting edges and fitting midway its length in recess 13, of bar 11, and projecting vertically upward from the center of cross bar 14 is a pivot pin or stud 15. At its ends the bar 14 fits between adjacent lugs 8 and 9, and is bolted thereto at 16, the crossed bars thus securing the two sections of the outer member rigidly together, and for the purpose of assisting in crushing cinders which may wedge between the outer member and the inner member, the former is provided with a circular series of inwardly projecting teeth 17.

The inner member of the grate is constructed as follows:—18 indicates a pair of semi-circular sections abutting together endwise, each end of each section being reduced to form a recess 19 and a tongue 20, the tongues of one member fitting in the recesses of the other member so that the tongues at the adjacent ends of the members shall occupy a superposed relation, and each section is provided with a circumferential depending flange 21 for stiffening and strengthening purposes which rests lightly on lugs 17^a projecting upward from the crossed bars 11 and 14, the said lugs thus guarding against bending of the pivot pin by preventing the inner member when unevenly loaded, from tilting or sagging more at one point than at another. The inner member is also provided in its inner edge with a circumferential groove 22, the upper walls 23 of the same terminating outward of the lower wall as shown clearly in Figs. 3 and 5.

24 is a slightly arched cross bar provided centrally with a circular enlargement 25 having a central opening 26 to receive the pivot pin or stud 15. At its opposite ends cross bar 24 is recessed in its upper side at 27 to receive the adjacent or abutting ends

of the semi-circular sections 18, the underlying portions of said cross bar being of greater width than the body of said bar as shown in Fig. 7, and provided with holes 28 to register with holes 29 in the ends of said sections 18, and the outer extremities of the widened portions of said cross bar are provided with depending strengthening flanges 30, which bear against the flanges 21 of said sections 18, the said flanges 30 being provided with holes 31 to register with holes 32, in said flanges 21. A washer 33 fits upon the pivot pin or stud and the cross bar 24 is slipped upon said pin or stud and rests upon the washer as shown in Fig. 3. Bolts 34 extend down through holes 29 of sections 18 and the holes 28 of the underlying widened portions of the cross bar 24, and retaining nuts 35 engage the lower ends of said bolts to secure the parts rigidly together. Bolts 36 are fitted through registering openings 32 and 31 of flanges 21 and flanges 30 and secure said parts rigidly together.

To brace the cross bar 24 against buckling or bending laterally when expanded by heat, a pair of cross bars 38 are bolted at their inner ends at 39 to the enlargement 25 of cross bar 24, and at 40 to the adjacent members 18, as shown clearly in Fig. 1. It will thus be seen that the cross bar 24 and brace bars 38 when bolted in position as explained, secure the semi-circular members rigidly together so as to constitute a rigid inner member and preferably said member is formed with teeth 41, which cooperate with the teeth 17 of the outer member in crushing or breaking up cinders which may fall between them and tend to prevent the inner member being easily rocked for the purpose of "shaking down" the fire and causing the ashes to drop into the ashpit (not shown) below the grate.

The crown of the grate consists of a series of radially-slotted segment-shaped sections 42 adapted to bear at their outer ends upon the lower walls of the grooves 22 of sections 18, and against the inner edges of the upper walls of said grooves, the said radially-slotted segmental sections terminating in tongues 43 fitting in said grooves, see Figs. 3 and 5. The radially-slotted segments or sections abut together sidewise and at their inner ends rest upon the enlargement 25 of cross bar 24, and to secure them in such position a cap 44 fits upon the inner ends and over the upper end of the pivot pin or stud, the bolts 39 which secure the inner ends of the brace bars 38 in position also extending through the inner ends of the superposed segmental sections 42 and said cap, as shown clearly in Fig. 3. It will be manifest that this cap not only secures the inner ends of the segmental sections 42 in position but also prevents ashes settling between the

pivot pin or stud and the rotary or inner member and interfering with the free rotation or oscillation of the latter.

When desirable the inner member can be turned completely around so that no one part shall be subjected always to a higher degree of heat than another part, such adjustment therefore enabling the person in control to dispose different parts of the inner member in the back part of the combustion chamber where it is subjected to the most intense heat.

From the above description it will be apparent that I have produced a grate which may be of such area when completed as to render it impossible to slip it through the ordinary fuel door opening or ash-pit door opening of the furnace but which in sections can be readily inserted into the furnace through either of the openings named and thus be easily and quickly assembled and which when assembled constitutes a strong, rigid and durable grate and while I have illustrated and described the preferred embodiment of the invention I wish it to be understood that I do not desire to be restricted to the exact details of construction shown and described as obvious modifications will suggest themselves to one skilled in the art.

I claim:—

1. A grate, comprising an outer member having a circular opening and crossed bars bridging said opening below the plane thereof, and a pin projecting upwardly beyond the upper bar axially of said opening, in combination with a circular inner member fitting rotatably in said opening and consisting of segmental sections abutting together endwise, a cross bar secured at its ends to the abutting ends of the segmental sections and provided with an enlargement midway its length having an opening through which said pin projects and supported by said crossed bars, braces secured at their inner ends to said enlargement and at their outer ends to different segments of the inner member, and slotted segments resting at their inner ends upon the enlargement of said cross bar and provided with tongues at their outer ends interlocked with the said segments.

2. A grate, comprising an outer member having a circular opening and crossed bars bridging said opening below the plane thereof, and a pin projecting upwardly beyond the upper bar axially of said opening, in combination with a circular inner member fitting rotatably in said opening and consisting of segmental sections abutting together endwise, a cross bar secured at its ends to the abutting ends of the segmental sections and provided with an enlargement midway its length having an opening through which said pin projects and sup-

ported by said crossed bars, braces secured at their inner ends to said enlargement, and at their outer ends to different segments of the inner member, slotted segments resting at their inner ends upon the enlargement of said cross bar and provided with tongues at their outer ends interlocked with the said segments, a cap fitting over the pivot and upon the inner ends of the segments resting upon the enlargement of the said cross bar, and fastening devices extending through the cap, said underlying segments, and the enlargement of said cross bar.

3. In a grate, an outer member having a circular opening and consisting of a plurality of sections abutting and lap-jointed together at their side edges and each provided near its abutting edge with a pair of depending lugs, and each provided about midway its length with a third lug, a cross bar extending diametrically of the member below the opening thereof and secured at its opposite ends to the said third lugs, a cross bar extending at right angles to the first-named cross bar and overlying the same and secured at its opposite ends to the lugs adjacent to the abutting edges of the sections,

the said overlying cross bar having an upwardly projecting pivot pin axially of the opening of the member and a circular fuel supporting member pivoted on said pin and rotatable in the said circular opening of the outer member.

4. In a grate, a circular member consisting of a pair of semi-circular segments of a ring abutting together endwise and provided with grooves, a cross bar abutting at each end against the inner edges of the abutting ends of the semi-circular segments, a plurality of bolts securing each semi-circular segment to the ends of said cross bar, and a plurality of inwardly-tapering slotted segments fitting at their inner ends on said cross bar and provided at their outer ends with tongues engaging the grooves of the semi-circular segments, and means for securing the inner ends of said inwardly tapering segments to the said cross bar.

In testimony whereof I affix my signature, in the presence of two witnesses.

THOMAS W. NICOL.

Witnesses:

HELEN C. RODGERS,
G. Y. THORPE.