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E. J. WHEELER

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GRATE

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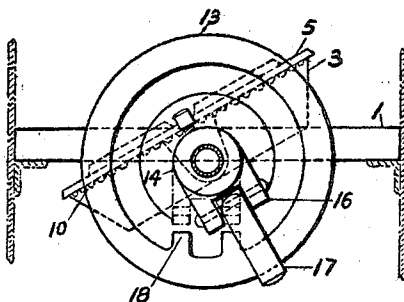
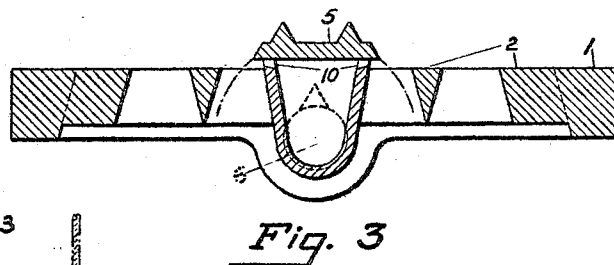
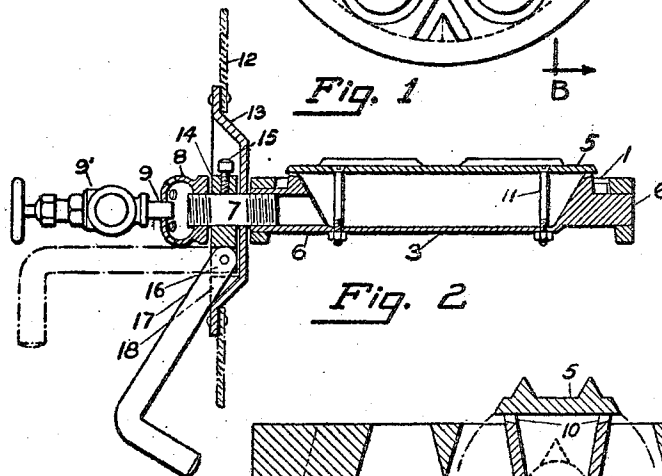
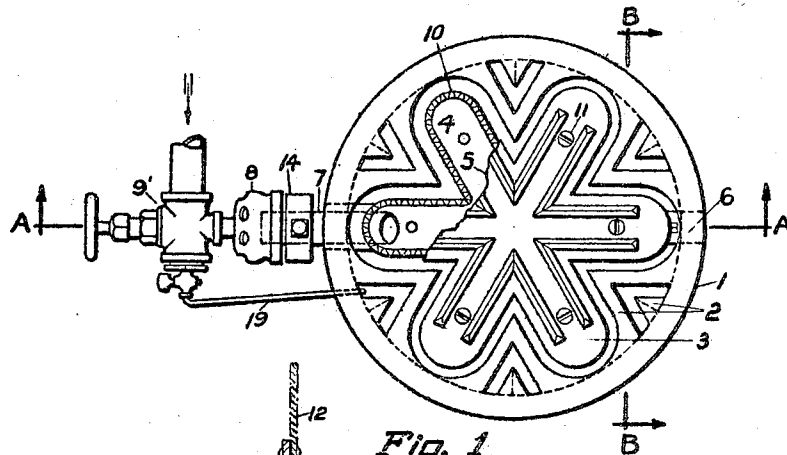


Fig. 4

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GRATE.

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To all whom it may concern:

Be it known that I, EDWARD J. WHEELER, a citizen of the United States, and a resident of Oakland, in the county of Alameda and State of California, have invented a new and useful Grate, of which the following is a specification.

This invention relates to improvements in grates for burning fuel of different kinds, such as solid and gaseous fuels, and in particular to combined gas and coal burning grates.

The objects of this invention are, to produce a grate adapted to burn either class of fuel by itself or combined; to produce a grate which may be shaken by angular oscillation about a horizontal axis, to break up lumps and clinkers and to dislodge and pass the debris to the ash pit below; to produce a grate which shall be self-locking in its normal position after being shaken; to produce a grate, such, that when burning gas it will deliver the gas for combustion at points above the surface of the fixed portion of the grate and in upwardly inclined jets; to produce a grate in which the gas chamber is substantially star-shaped and provided with an overhanging cover of similar shape adapted to protect the jet orifices from clogging or injury from above; and to produce a grate in standard sizes adapted to be applied to existing stoves or furnaces, converting them into combined gas and coal burning units.

In carrying out my invention, I make a grate having a fixed member and a shaker-member, the latter being preferably of blunt-star formation, and the fixed member complementary thereto, but separated by a continuous and equal space therefrom so that the former may operate within the latter. Both members are tapered downward severely, so that all slots or spaces are wider below than above, to facilitate positive discharge of debris and ash from above.

The shaker-member is provided with trunnions for shaking purposes, and one trunnion is hollow for the passage of gas. The shaker-member is also the gas chamber and has arms of gutter-form, the entire upper edges thereof being serrated to form jet orifices for issuance of the gas to the fire box. The chamber is provided with a lid or cover corresponding to the shape of said chamber, whose edges overhang or project beyond the said serrated edges to protect

them from clogging or injury and thus keep the orifices open and free.

In addition to the above broader features of the invention, there are certain details of design, whereby compactness, simplicity and durability of structure, as well as positiveness and ease of operation are obtained, and which are shown on the accompanying sheet of drawings, and will be set forth hereinafter.

I will describe my invention as applied to round grates, that being the type most called for at present, though it may be applied to rectangular or other forms as desired.

Figure 1 of the drawings is a top or plan view of the grate, showing also the gas connection. A part of the cover-plate is broken away to show interalia, the serrations or gas orifices.

Figure 2 is a partial cross-section, taken on the line A—A of Figure 1, and shows also in dot-and-dash lines a side wall of a furnace to which the invention is applied. It also shows the two positions of the handle for shaking the grate, the normal locked position being in full lines, and the position for shaking in dot-and-dash lines.

Figure 3 is a cross-section on a larger scale, taken on the line B—B of Figure 1, and shows clearly the tapered structure of the parts, and also the relative position of the shaker-member above the fixed member. The dot-and-dash lines represent the loci of the shaker-member when oscillated to dislodge ash between the parts and from the grate.

Figure 4 is a face view taken from the left of Figures 1 and 2, certain parts being omitted, and shows one position to which the shaker-handle has been oscillated, the corresponding position of the shaker-member being also indicated. The locking-lugs are shown in full lines and the normal position of the movable lugs in dot-and-dash lines. The figure indicates also the sides of the fire pot supporting the fixed member.

Referring to the drawing and the figures thereon: The fixed member of a furnace grate is represented by the numeral 1. It comprises an outer ring with inward projections 2, forming a star-shaped central opening adapted to be concentrically occupied by the shaker-member 3. This latter member comprises the radiating hollow arms 4 and cover-plate 5 and trunnions 6 upon

which the member oscillates when shaken. It will be observed that one of the trunnions is hollow and provided with a pipe nipple 7.

On the outer end of nipple 7 is secured an air mixer 8, pivotally connected as at 9 to a gas supply control 9', whereby the mixed gas and air are supplied to the chamber of the shaker-member 3. The surface of the latter member projects above the surface of the fixed member and the entire upper edges of its radiating arms are notched or serrated as at 10 in an upwardly-inclined position, thus affording jet orifices for the exit of the combustible mixture in partial conical formation into the combustion chamber or fire pot of the furnace or heating unit. This conical formation induces a perceptible forced draught in the furnace. These orifices are protected by the overhanging edges of the cover-plate 5. Bolts 11 fasten the cover-plate 5 to the arms 4. The jet orifices 10 formed by the serrations are shown clearly in Figure 3.

The side of the furnace 12 is cut away adjacent to the nipple 7, and the opening closed by a pie-plate-shaped member 13 fitted concentrically on the nipple. On the outer side of this member 13 is positioned a ring 14 fitted on the nipple and secured thereto by a set-screw 15. The lower side of the ring is provided with a pair of lugs 16, between which is pivoted the shaker-handle 17. For shaking purposes the handle is raised to the position shown in dot-and-dash lines in Figure 2, and then oscillated. The handle is then dropped back to the position shown in full lines in that figure, in which position it engages between a pair of lugs 18 on the member 13 and is automatically locked thereby, thus locking the shaker-member of the grate in its normal horizontal position. If a gas fire is desired, the gas may now be turned on and will flow from the main at 9', through the members 8 and 7 into the chamber and hollow arms 4 and out through the jet-serrations 10, and will be ignited by the pilot light at 19. In the absence of the pilot light a bit of burning paper thrown into the fire pot will suffice for ignition of the gas. Solid fuel may be burned on the grate in the ordinary way when desired and the gas turned off, or the gas may be used auxiliary thereto for the ignition of the solid fuel.

In the drawings I have shown an embodiment of my invention, but it is to be understood that the invention may be embodied in other forms, each being a species of my invention, and the patent protection that I desire, is all of that which comes within the spirit and scope of what I claim as new, and which claims are the following:

1. A grate adapted for gaseous and solid fuel, comprising a star-shaped shaker-member

mounted on trunnions and a fixed member of complementary shape supporting the same, the shaker-member being within the fixed member and spaced therefrom and adapted to be turned through the fixed member to break debris lodgments therebetween.

2. A grate for gaseous and solid fuel, comprising a fixed member and a shaker-member, said shaker-member having gutter-formed arms and a cover-plate therefor, and said arms being serrated along their entire upper edges and said cover-plate being of a width to overhang said serrated edges for the protection thereof, and the surface of said serrated edges projecting above the surface of the fixed member for unobstructed issuance of the gaseous fuel thereover.

3. A grate for gaseous and solid fuel, comprising a fixed member and a shaker-member, said fixed member having an irregular opening and said shaker-member shaped to be housed therein, the latter member being hollow and mounted on trunnions and one of said trunnions being hollow and adapted for connection to a gas supply and the said shaker-member provided with gas outlets along the edges of its top surface, and said latter member also provided with a handle connected thereto to oscillate the same on its trunnions to break debris lodged in said opening between said members.

4. A grate for gaseous and solid fuel, comprising a fixed member having an irregular opening and a shaker-member housed therein, said latter being hollow and mounted on trunnions and one of said trunnions being hollow and adapted for connection with a gas-supply, said shaker-member having gas outlets along the edges of its top surface and a handle connected to said shaker-member adapted to oscillate the same on its trunnions in said fixed member, and said latter member provided with gravity means for locking said shaker-member against oscillation with respect to said fixed member.

5. In combination with a furnace or the like, a grate having a hollow shaker-member mounted on trunnions, one of said trunnions being hollow and adapted for connection to a gas-supply, a shaker-handle pivoted to said member and adapted when swung to horizontal position to oscillate the said member, and the said furnace provided with a pair of lugs on its wall, and the said handle adapted to hang by gravity between the said lugs when in non-operative position and be locked thereby against oscillation.

In testimony whereof I affix my signature.

EDWARD J. WHEELER.