May 4, 1926. 1,582,951

U. WEDGE

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Fig. 1.

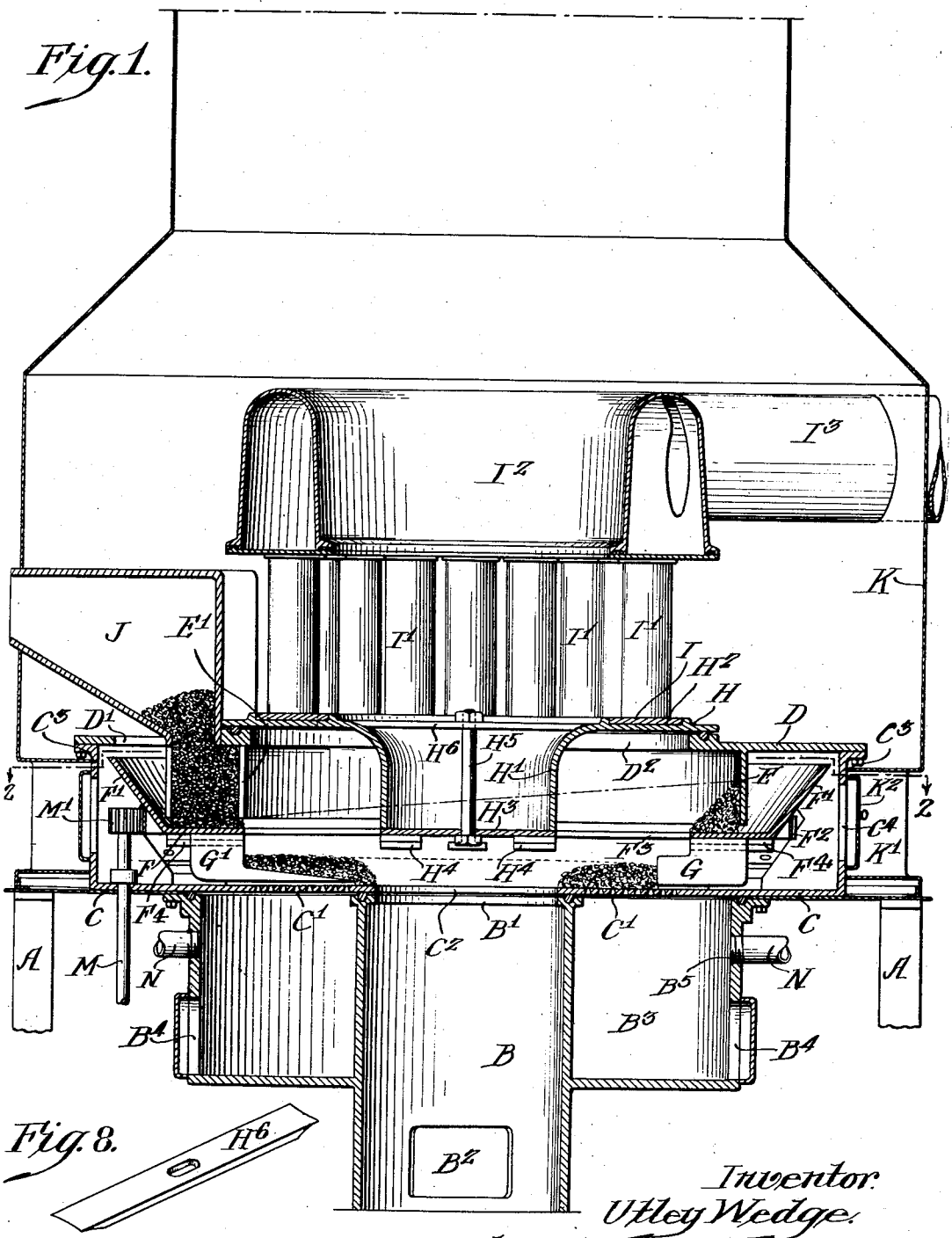


Fig. 8.

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Fig. 2.

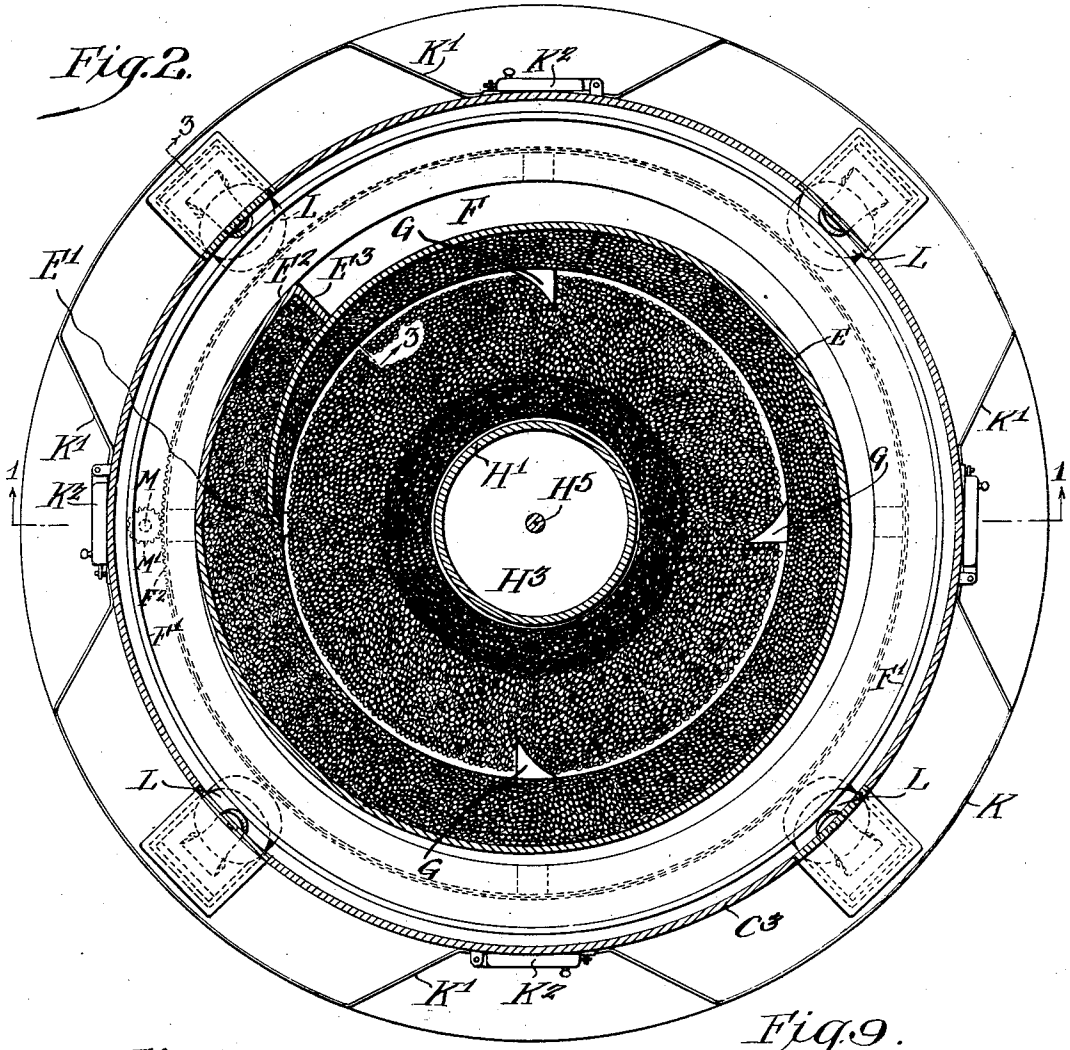


Fig. 3.

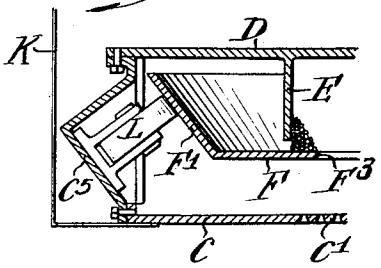
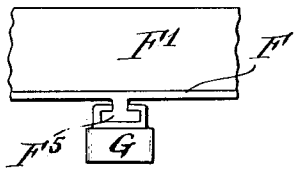


Fig. 9.



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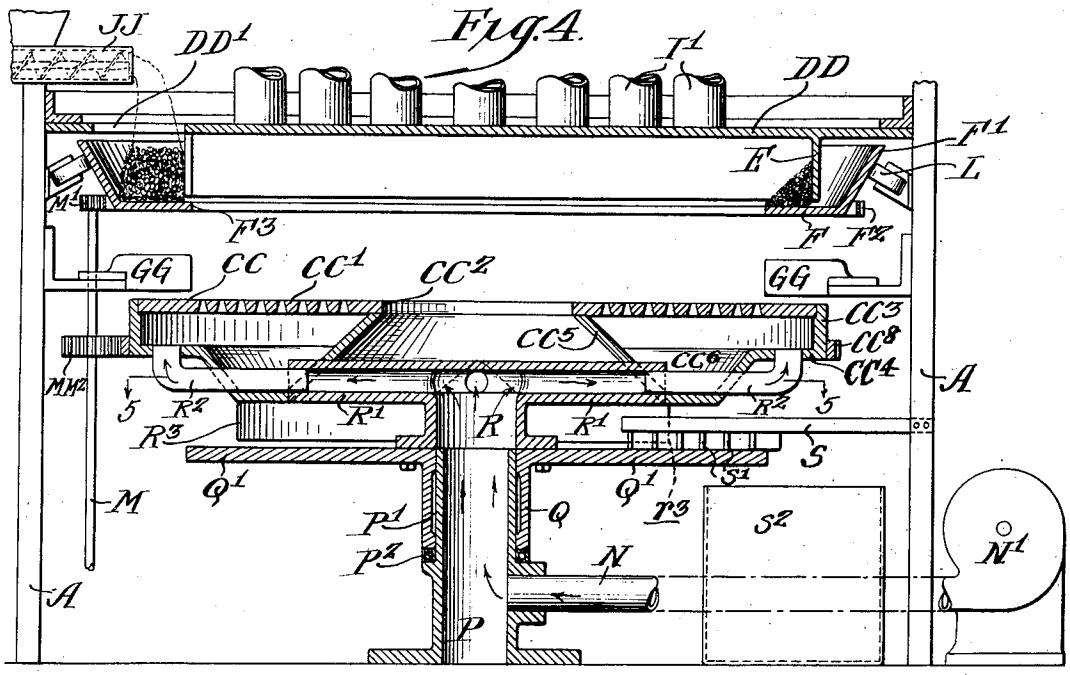
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Fig. 4.



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Fig. 5.

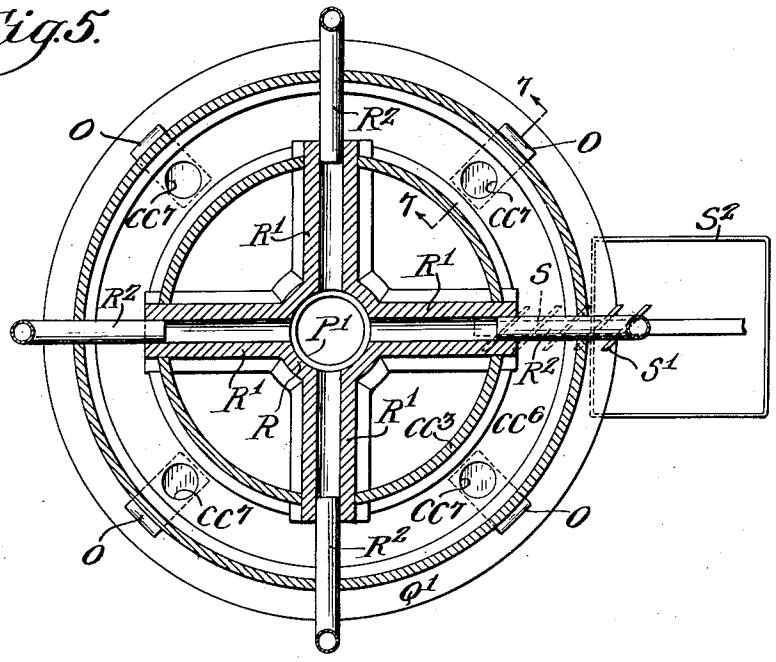


Fig. 6.

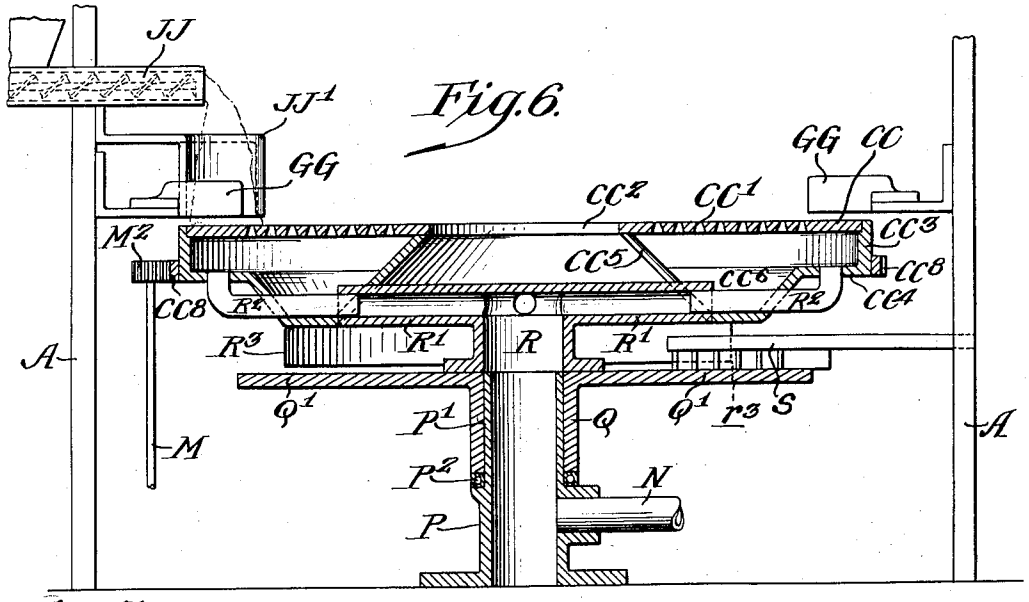
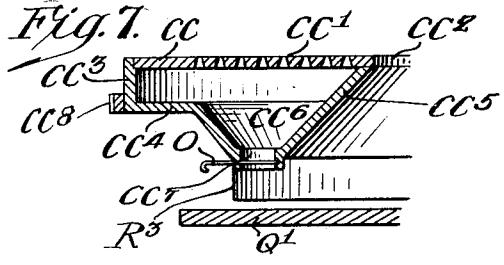


Fig. 7.



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Fig. 10.

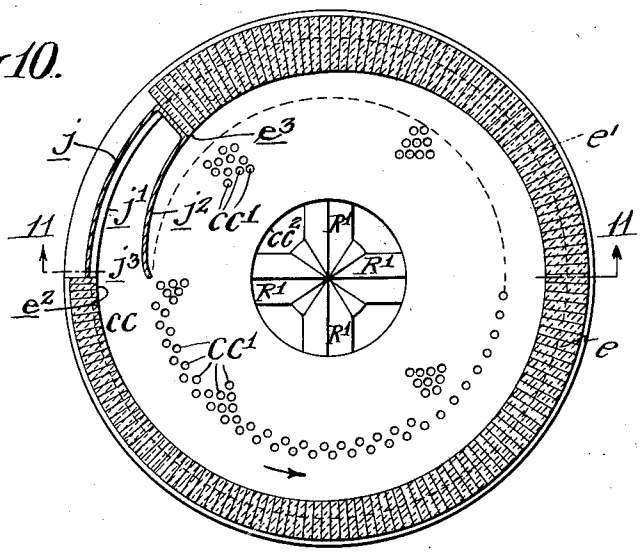
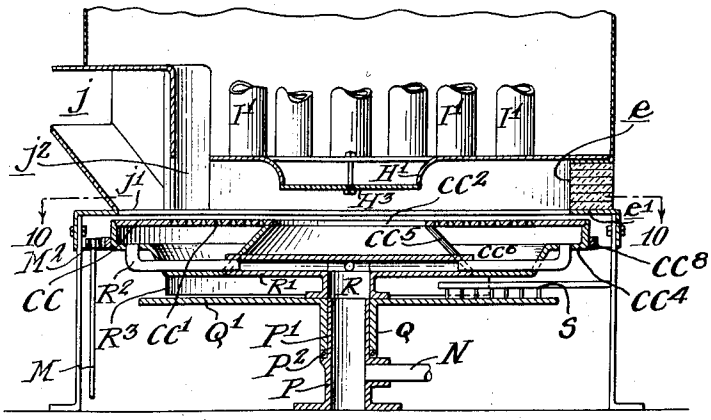


Fig. 11.



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Patented May 4, 1926. 1,582,951

UNITED STATES PATENT OFFICE.

UTLEY WEDGE, OF ARDMORE, PENNSYLVANIA.

FURNACE.

Application filed January 4, 1923. Serial No. 610,581.

To all whom it may concern:

Be it known that I, UTLEY WEDGE, a citizen of the United States of America, and resident of Ardmore, in the county of Montgomery, State of Pennsylvania, have invented a certain new and useful Improvement in Furnaces, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to furnaces for burning carbonaceous fuel and has for its object to provide a furnace especially well adapted for the economical burning of solid fuel and at the same time one of great simplicity of construction and operation. While my invention embodies features of very general useful application, it is especially adapted and designed for use as a furnace for domestic heating.

The nature of my improvements will be best understood as described in connection with the drawings in which they are illustrated and in which—

Figure 1 is a sectional elevation of a furnace embodying my invention taken as on the section line 1—1 of Fig. 2.

Figure 2 is a horizontal section of the furnace taken on the section line 2—2 of Fig. 1.

Figure 3 is a sectional view on the line 3—3 of Fig. 2.

Figure 4 is a sectional elevation of a modified form of furnace also embodying the main features of my invention.

Figure 5 is a sectional plan view on the line 5—5 of Fig. 4.

Figure 6 is a sectional elevation showing still another modification of the furnace construction still embodying leading features of my invention.

Figure 7 is a sectional view on the line 7—7 of Fig. 5.

Figure 8 is a perspective view of a detail of construction shown in Fig. 1.

Figure 9 is a view illustrating a detail of construction, and

Figure 10 is a partly diagrammatic sectional plan view of another and preferred modification of my furnace taken on line 10—10 of Fig. 11, and

Figure 11 is a sectional elevation of my preferred modification.

Referring first to the construction shown in Figs. 1, 2, 3 and 9, A, A, indicate parts of the framing supporting the outer portions of the furnace structure. B is a cylinder open at the top, as indicated at B^1, and having an ash door, as indicated at B^2. On the outside of this cylinder B is located an annular chamber B^3, having ash doors B^4, lying immediately below the grate, to be described. C is an annular plate supported on the cylinders B and B^3, as shown, having a circular opening C^2 at its center and having formed in or supported upon it grate bars, as indicated at C^1, forming an annular grate opening into the ash receptacle B^3, as shown. As shown, the furnace chamber is enclosed by an upright annular wall C^3 having door closed openings, as indicated at C^4. D is an annular plate supported on the top of the wall C^3, having formed in it an opening D^1 for the coal hopper, and having, as shown, a circular opening D^2 in its center; firmly secured to or formed with the plate D is the volute feeding device indicated at E, the inner end of which is indicated at E^1, Fig. 2, and the outer end at E^2, E^3 indicating a wall connecting the outer portion E^2 with the center portion at some distance from its end so as to form, as shown in Fig. 2, a coal pocket. F is an annular rotatable shelf having, as shown, an outwardly and upwardly flared edge, as indicated at F^1, and having also attached or connected to it a gear wheel F^2. This shelf is located above the grate with its inner edge F^3 so located with regard to the grate that coal dropped from it will fall upon the grate at its outer edge or somewhat inside its outer edge. G, G, indicate feeding devices secured to holding shoulders F^4 attached to the bottom of the shelf F and so shaped as to push the coal inward on the grate as they rotate with the shelf. G^1 is a somewhat similar device but shaped and arranged so as to act as a slicing bar. The furnace chamber is further closed by a plate H which, as shown, is curved downward, as indicated at H^1, and formed with a seat H^2 to receive an annular plate from which the heating drums arise. The bottom of the cylindrically formed downward extension is closed by a plate H^3 having, as shown, ledges H^4 secured to it and held in place by a bolt H^5 passing through a cross bar H^6. I is an annular plate which rests in the annular seat H^2 and from which extend upward the heating drums I^1, I^1, etc. which, at their tops communicate with the annular drum I^2 from which extends the smoke flue I^3. J, Figure 1, is a coal hopper. K is the outer casing of the furnace which is recessed, as indicated

at K^1, at points where openings C^4 occur in the wall C^3 and provided with doors, as indicated at K^2. L, L, etc. are rollers which support the shelf, the flanged portion F^1 of which rests upon the rollers, as indicated best in Fig. 3. M is a power driven shaft to which is attached a gear wheel M^1 which engages the gear F^2. N is an air pipe leading from a fan to the annular chamber B^3. In operation coal is charged into the hopper J and deposited from this hopper on the rotating shelf F and as the shelf rotates the coal is pressed into contact with the inner face of the volute E which in turn presses the coal inward over the surface of the shelf so that it is constantly fed over the inner edge of the shelf to the grate lying below it. As the shelf revolves, the feeding devices G, acting on the coal, or other fuel, resting on the grate, press the fuel inward over the grate so that the ashes finally fall over the edge C^2 into the ash receptacle B. Such ash as passes through the grate falls into the chamber B^3. It will some times be convenient to attach tools for acting on the fuel to the tool holder H^4 attached to the plate H^3.

Referring next to the modified construction shown in Figs. 4 and 5, the hearth which is here made rotatable is supported on a hollow cylinder P having a bearing surface P^1 and bearing shoulders indicated at P^2. The air pipe N leading from the fan N^1 enters the cylinder P. Q is a cylindrical bearing supported on the cylinder P, as shown, and having an annular table-like extension Q^1. Supported on and attached to the bearing Q is the sleeve R having extending from it the hollow arms indicated at R^1, R^1, these arms being preferably of triangular section, as indicated in dotted lines in Fig. 4, and from the ends of the hollow arms extend the open pipes R^2 through which air is fed to the chamber lying beneath the grate. CC is a plate having formed in or attached to it the annular grate indicated at CC^1, the grate having the central opening indicated at CC^2 and the plate and grate are supported on the walls CC^3 and CC^5 of the chamber formed by these walls and a bottom indicated at CC^4 having formed in it depending hoppers, indicated at CC^6, with apertures CC^7 closed by the slides O for the collection and removal of ashes. The air pipes R^2 enter this chamber, as shown, and a gear wheel CC^8 is attached to the outside of the wall CC^3 and is engaged by a gear MM^2 mounted on the power driven shaft M, as shown in Fig. 4. GG, indicate fuel feeders which, in this case, are attached in fixed position to the frame A and which act to push the fuel inward over the annular grate as the grate revolves. J, J, indicates a conveyor for feeding fuel to the shelf F which shelf and its supporting parts are as previously described. The volute E in this construction is attached to a plate DD from which the drums I^1 directly extend. S is an arm attached to the framing A and having sweepers S^1 which sweep the ashes off the table Q^1 into an ash receptacle indicated at S^2. In operation the shelf F and grate CC^1 both revolve, though at different rates of speed. The fuel is fed from the shelf F, by the volute E and falls on the outer circumference of the grate and is fed inward over the grate by the action of the stationary feeders GG. The ash, passing over the edge CC^2, falls upon the rotating table Q^1 and is swept from it by the sweepers S^1.

The construction illustrated in Fig. 6 is substantially the same as that illustrated in Fig. 4 except that the conveyor JJ feeds the fuel into a receptacle JJ^1 from which it passes directly to the surface of the grate without the intervention of a rotating shelf as in the previously described constructions. The grate being in revolution the fuel is distributed over all portions of its outer surface and moved inward by the feeders GG as before described.

In my preferred construction shown in Figs. 10 and 11, the rotating grate construction is similar to that of Figs. 4, 5 and 6, the annular grate having an unperforated outer portion CC and a perforated inner portion CC^1 and a rack CC^8 engaged by a driving gear M^2, but in this construction I provide a volute feeder in the form of a wall *e* supported on a plate e^1 and lying close to the unperforated outer portion CC of the grate surface. This volute wall registers with the open side j^3 of a hopper *j* at its end e^2 and, gradually approaching the centre of the grate, abuts against the closed side of the hopper at its other end e^3. The wall j^2 of the hopper forms, in effect, a continuation of the volute feeder wall *e*. In this construction, as in that of Fig. 6, the unperforated outer portion CC of the grate, like the shelf F in Fig. 4 supports the fuel out of the path of the air introduced to support combustion but exposed to the heat of the furnace chamber so that the fuel is exposed to a distilling or coking action before it is moved inward over the perforated portion CC^1 of the grate by the volute wall *e*.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a furnace for burning carbonaceous fuel, an annular substantially flat grate having a central opening in combination with means for feeding fuel to the outer portions of the grate and means for progressively pushing the fuel deposited on the outer portions of the grate, and through it the fuel resting on the inner portion of the grate, inward toward the central opening of the grate.

2. In a furnace for burning carbonaceous

fuel, an annular substantially flat grate having a central opening in combination with an annular unperforated fuel receiving plate extending outside the perforated grate, means for rotating the fuel receiving plate, means for feeding fuel to the rotating unperforated fuel receiving plate, and means for progressively pushing the fuel inward over the fuel receiving plate onto the perforated grate and inward over the perforated grate towards its central opening.

3. In a furnace for burning carbonaceous fuel an annular substantially flat grate having a central opening in combination with means for feeding fuel progressively to and around the outer portion of the grate and positively acting means acting directly on the fuel supported on the outer portion of the grate for pushing the fuel resting on the grate inward towards the central opening thereof.

4. In a furnace for burning carbonaceous fuel an annular substantially flat grate having a central opening in combination with means for feeding fuel progressively to and around the outer portion of the grate and positively acting means acting directly on the fuel supported on the outer portion of the grate for pushing the fuel resting on the grate progressively inward over all portions of the grate towards its central opening.

5. In a furnace for burning carbonaceous fuel an annular substantially flat grate having a central opening in combination with means for feeding fuel progressively to and around the outer portion of the grate and progressively inward over all portions of the grate towards the central opening, said means comprising a volute feeding wall extending above the grate in proximity to the periphery thereof and said wall and grate being relatively rotatable so that the volute wall acts to progressively push the fuel inward.

6. In a furnace for burning carbonaceous fuel an annular rotating grate having a central opening in combination with means for feeding fuel to the outer portion of the rotating grate and a stationary volute feeding wall extending above the grate in proximity to the periphery thereof and acting in connection with the revolving grate to progressively push the fuel inward over the grate.

UTLEY WEDGE.