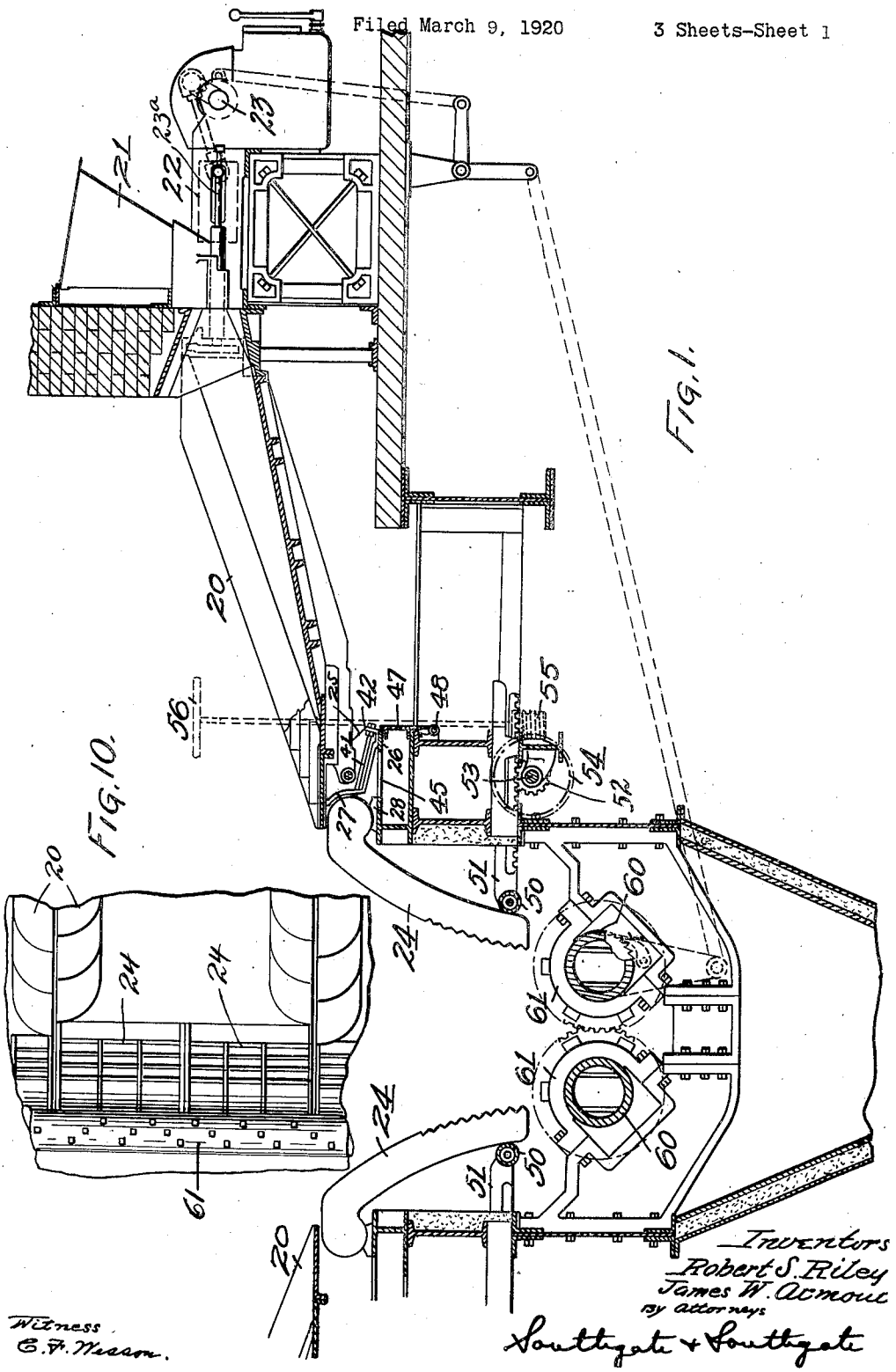
Nov. 2, 1926. 1,605,665

R. S. RILEY ET AL

UNDERFEED STOKER

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R. S. RILEY ET AL

UNDERFEED STOKER

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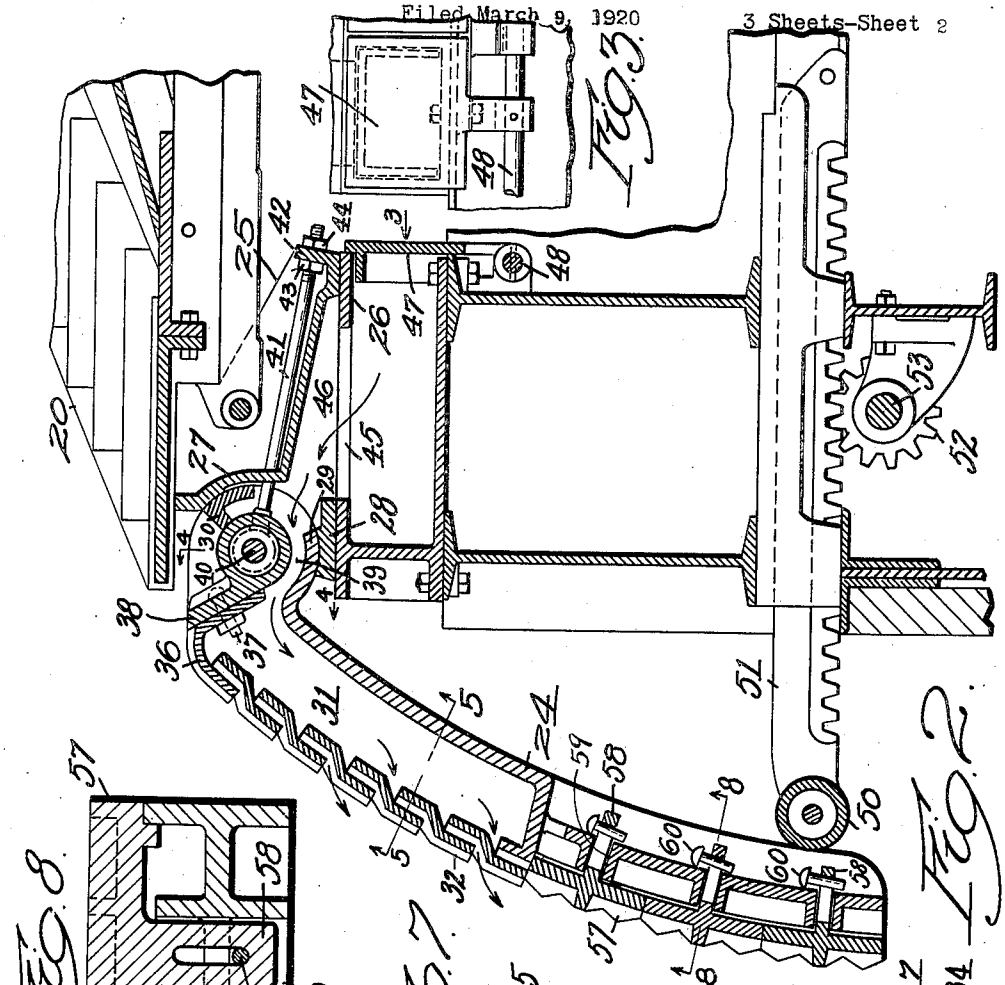


Fig. 2.

Fig. 8.

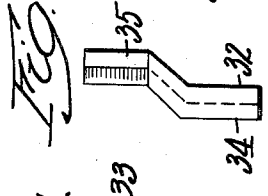


Fig. 7.

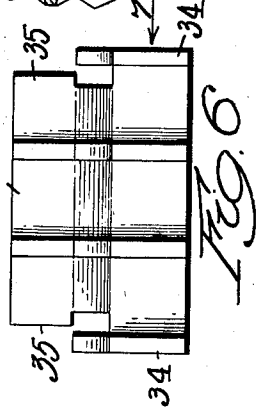


Fig. 6.

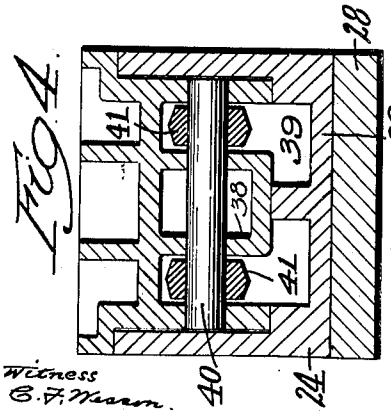


Fig. 4.

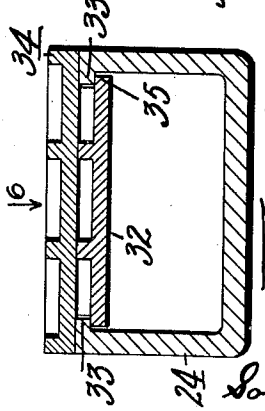


Fig. 5.

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UNDERFEED STOKER

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3 Sheets-Sheet 3

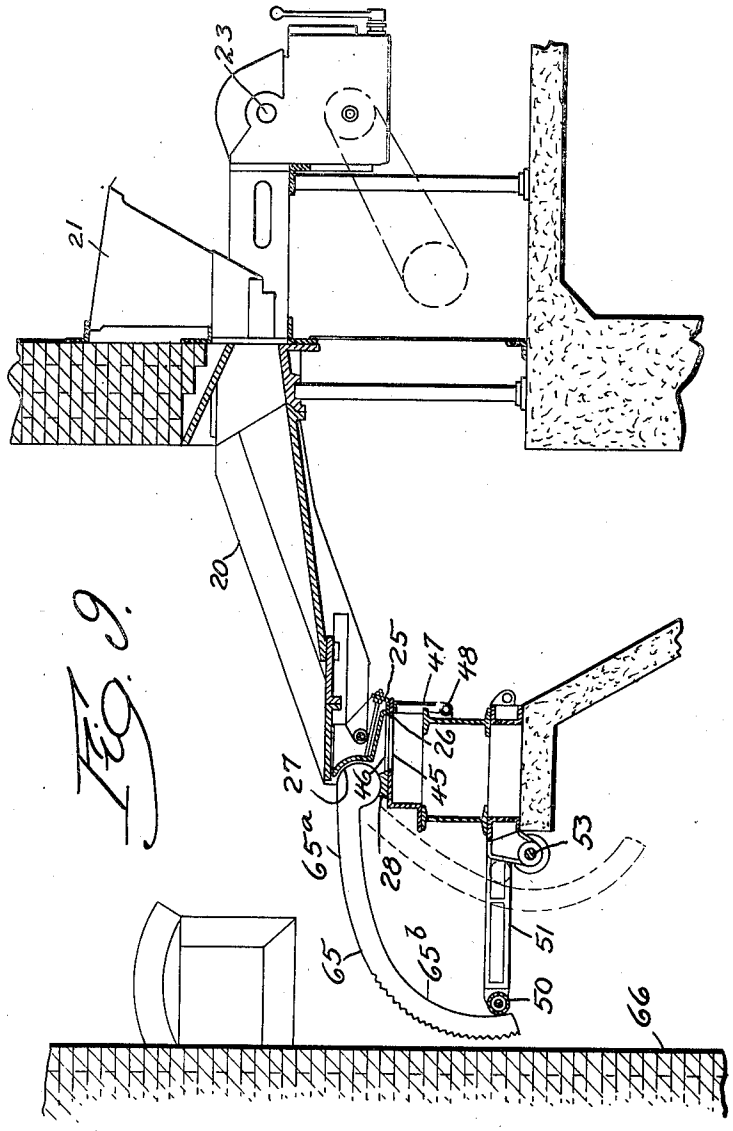


Fig. 9.

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UNITED STATES PATENT OFFICE.

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UNDERFEED STOKER.

Application filed March 9, 1920. Serial No. 364,509.

This invention relates to underfeed stokers, and particularly to that type of underfeed stoker in which the retorts or portions thereof are reciprocated during the operation of the stoker mechanism.

One object of our invention is to provide an improved construction of rocking discharge member for such stokers, in which air is admitted to the fuel as it is supported thereby or passes downwards toward a discharge opening.

Another object is to improve the construction of the discharge member itself, and to provide a new and improved pivotal bearing therefor. Further features of our invention relate to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

A preferred form of our invention is shown in the drawings, in which—

Fig. 1 is a partial sectional elevation of our improved stoker with certain parts shown diagrammatically;

Fig. 2 is an enlarged sectional elevation of one of the discharge members, and parts associated therewith;

Fig. 3 is a detail front elevation taken in the direction of the arrow 3 in Fig. 2;

Figs. 4 and 5 are detail sectional views taken along the lines 4—4 and 5—5 in Fig. 2 respectively;

Fig. 6 is a plan view of a grate section for a discharge member;

Fig. 7 is a side view thereof;

Fig. 8 is a detail sectional view taken along the line 8—8 in Fig. 2;

Fig. 9 is a side elevation of a slightly different arrangement of our invention; and

Fig. 10 is a partial plan view of the stoker shown in Fig. 1.

Referring to the drawing, and particularly to Fig. 1, we have shown our invention embodied in a duplex underfeed stoker in which oppositely disposed retorts discharge their refuse above a pair of clinker grinders disposed between and below the inner or rear ends of the retorts. Each half of the stoker preferably comprises a plurality of retorts having movable side walls 20. Fuel is supplied to each retort from a hopper 21 by a plunger 22 driven by a crank shaft 23. Lost-motion connections 23^a are provided between the plunger and the side-walls, so that the travel of the plunger may be materially greater than the movement of the side walls.

The mechanism thus far described is of well known construction, and forms no part of our invention.

At the rear of the retort, we provide sectional discharge members 24, one such member being preferably provided for each section of the retort side walls. The rear end of each retort side wall is supported by a block 25 slidable upon a frame member 26. The blocks 25 constitute rear bearings for the side walls, and are also each provided with concave segmental bearing surfaces 27 and 28 adapted to receive similar convex bearing surfaces 29 and 30, formed on the upper end of each discharge member 24.

This member 24 is provided with an air chamber 31 covered by a plurality of grate sections 32 (Figs. 6 and 7). The sides of the member 24 are provided with inwardly projecting flanges 33 (Fig. 5) adapted to fit between a projecting outer portion 34 of the grate section 32 and a smaller inner projection 35. The grate sections 32 are placed in position by inserting them at the open upper end of the discharge member 24, and they are held in position by a removable plate or cap 36 (Fig. 2) secured by bolts 37 to a hub member 38.

The hub member 38 fits in a recess 39 in the upper end of the discharge member 24 and is provided with bearings for a rod 40 which also extends through the recessed ends of a pair of eye-bolts 41. These bolts 41 extend forward in the block 25 to the front edge of the block, where they are firmly secured to a flange 42 (Fig. 2) by locking nuts 43 and 44. By adjustment of the nuts 43 and 44, the discharge member 24 may be firmly seated against the bearing surfaces 27 and 28. It will be noted that all parts of the bearing are of such construction that accurate workmanship is unnecessary, and that the parts may be readily removed and replaced when necessary. Furthermore, the retaining nuts 43 and 44 are removed from the region of extreme heat which would tend to destroy the usefulness thereof.

The frame member 26 upon which the block 25 is supported also constitutes an air duct extending transversely of the series of retorts, and is provided with upper openings 45 through which air may enter a pas-

sage 46 in the block 25, and then pass through the recess 39 to the chamber 31, from which it is discharged between the grate sections 32. Dampers 47 (Fig. 2) control the admission of air to the blocks 25 (Figs. 2 and 3). All of the dampers 47 are mounted upon a shaft 48 extending transversely of the furnace and manually adjusted in any convenient manner.

The lower end of each discharge member 24 rests against a roller 50 mounted at the rear end of a rack bar 51 slidable in fixed bearings in the frame of the stoker and engaged by a pinion 52 on a shaft 53 extending transversely of the furnace and having at its outer end a worm wheel 54 rotatable by a worm 55 connected to a hand wheel 56. The rack bars 51 may thus be moved forward or rearward to vary the position and operation of the discharge members 24.

Separate dead plate sections 57 (Figs. 2 and 8) are provided at the lower end of each discharge member 24, said sections 57 having slotted rearward projections 58 extending through openings 59 in the member 24, and adapted to receive headed fastening members 60. Each section 57 may be readily removed and replaced when necessary.

In Fig. 1 we have shown oppositely disposed furnaces cooperating with a pair of clinker grinders located between the opposed retorts and below their discharge members. These grinders rotate so that their upper portions approach each other, and may be actuated by a pawl and ratchet mechanism from the crank shaft 23 as indicated in Fig. 1. This driving mechanism is merely illustrative and any other suitable driving mechansm may be provided.

Having thus described the construction of our improved stoker mechanism, the operation and utility thereof will be apparent.

Each discharge member 24 is pivoted directly to a reciprocating retort section. The air supplied through the grate section thereof continues the combustion of any unconsumed carbon during the progress of the refuse along the discharge member towards the clinker grinder. The fuel is thus thoroughly agitated and is supplied with air under pressure to consume the last remnants of carbon therein.

This air is provided by a fan or blower (not shown) or by other suitable mechanism forming no part of our invention.

All parts are of simple construction, easily removed and replaced, and provision is made for all necessary adjustments in the operation thereof.

In Fig. 9 we have shown a furnace of the single instead of the duplex type and have omitted the clinker grinder. The rocking discharge member 65 is of somewhat different curvature and is adjusted in such a position that the upper portion 65^a of the member 65 acts to some extent as a support for the fuel, while the lower portion 65^b feeds the refuse downward and crushes it against the rear wall 66 of the furnace. The upper portion 65^a of the discharge member 65 may be provided with air admitting grate sections and the portion 65^b with dead plate sections, all as previously shown and described. A clinker grinder may be used with the single furnace shown in Fig. 9, as well as in the combination shown in Fig. 1, but it not considered necessary to include a drawing to show such use. It will also be understood that the type of discharge member shown in Fig. 2 may be equally well used in the combination shown in Fig. 9.

Having thus described our invention, it will be evident that changes and modifications can be made therein by those skilled in the art within the spirit and scope of our invention as set forth in the claims, and we do not wish to be otherwise limited to the details herein disclosed, but what we claim is:—

1. An underfeed stoker having in combination a retort with movable side walls, a plurality of ash discharge members each connected at one end for movement with one of said side walls and extending downward to form one side of an ash discharge pocket, and means to reciprocate each wall and oscillate each member, said discharge members each having an air chamber in its upper portion and grate openings therefor in its upper rear surface.

2. In an underfeed stoker, in combination, a movable ash discharge member extending downward to form one side of an ash receiving pocket and having an air chamber in its upper portion, a plurality of removable grate sections covering said chamber, and removable dead plate sections secured to the lower portion of said discharge member.

3. An underfeed stoker having, in combination, a plurality of longitudinally movable retort members, movable ash discharge members associated therewith and forming one side of an ash receiving pocket, each discharge member being chambered and having an overfeed grate section and a pivotal bearing connection between each retort member and its discharge member, said bearing connection having an air passage therethrough by which air is conducted to said grate section.

4. An underfeed stoker having, in combination, a movable retort member, a rear support therefor, an ash discharge member movable with said retort member and extending downward to form one side of an ash receiving pocket, said ash discharge member having an air chamber therein and

a grate section overlying said chamber, said support having spaced concave segmental bearing surfaces bordering an air passage and said ash discharge member having spaced convex bearing surfaces co-operating with said concave bearing surfaces and having a radially disposed air admitting passage between said convex bearing surfaces, and means to hold said concave and convex bearing surfaces in engagement with each other.

5. An underfeed stoker, having, in combination, a movable retort member, a rear support therefor, and a movable ash discharge member extending downward to form one side of an ash receiving pocket, said support having concave segmental bearing surfaces therein and said ash discharge member having convex bearing surfaces co-operating with said concave bearing surfaces, and means to hold said bearing surfaces in engagement with each other, said means comprising a rod in the bearing portion of said ash discharge member, eye bolts through which said rod extends, and means to tighten said eye bolts.

6. An underfeed stoker having, in combination, oppositely disposed movable members forming opposed retorts, a pair of clinker grinder rolls positioned between and below said retorts, means to rotate said grinder rolls, a plurality of ash discharge members extending downward adjacent said grinder rolls and each having a grate portion at its upper end, connections by which each discharge member is moved with its respective retort member, and means to supply air to the upper portion of each discharge member.

7. An underfeed stoker having, in combination, a plurality of parallel fuel retorts, a structure defining a deep ash receiving pocket extending transversely at the rear of said retorts, a clinker grinding device, air admitting ash discharge members forming the front wall of said pocket and extending downward adjacent said grinding device, air supplying connections to said members, means to move said device, and means to oscillate said members to jointly effect ash discharge.

In testimony whereof we have hereunto affixed our signatures.

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JAMES W. ARMOUR.