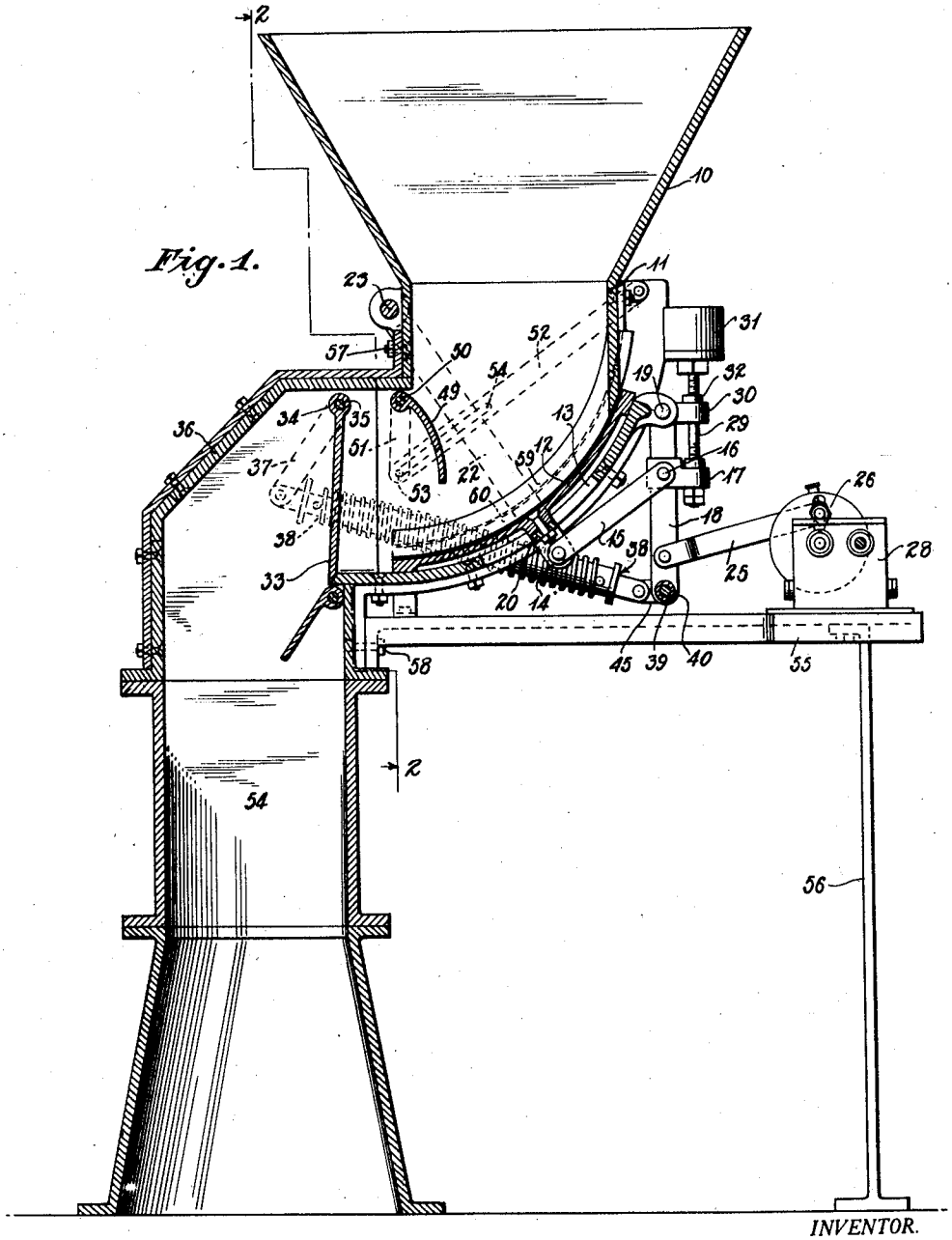
April 24, 1928. 1,667,230

W. WARD

STOKER AND THE LIKE

Filed June 20, 1927 4 Sheets-Sheet 1

Fig. 1.



INVENTOR.

Wilburt Ward

BY Browne & Phelps

ATTORNEYS

April 24, 1928. 1,667,230

W. WARD

STOKER AND THE LIKE

Filed June 20, 1927 4 Sheets-Sheet 2

Fig. 2.

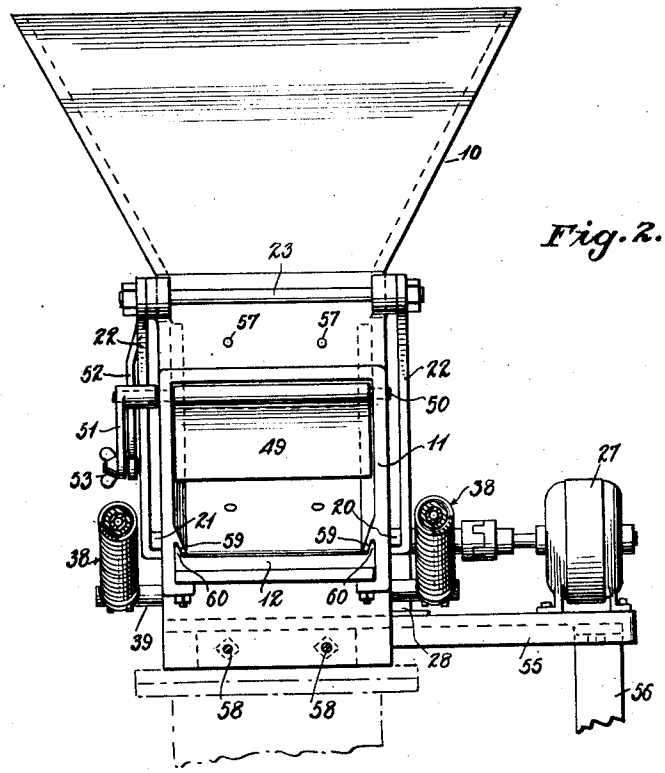


Fig. 3.

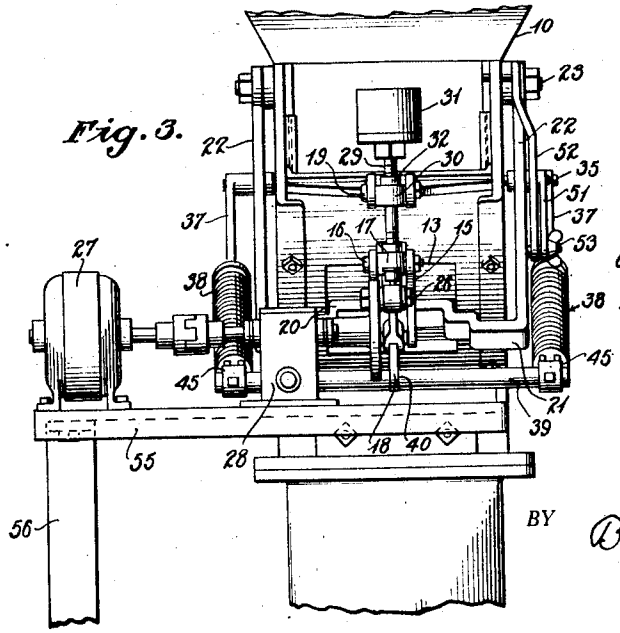
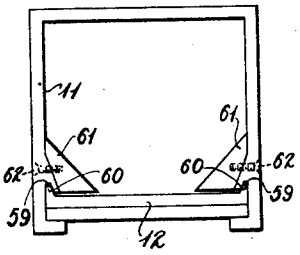


Fig. 4.



INVENTOR.
Wilburt Ward
BY Browne & Phelps
ATTORNEYS

April 24, 1928. 1,667,230

W. WARD

STOKER AND THE LIKE

Filed June 20, 1927 4 Sheets-Sheet 3

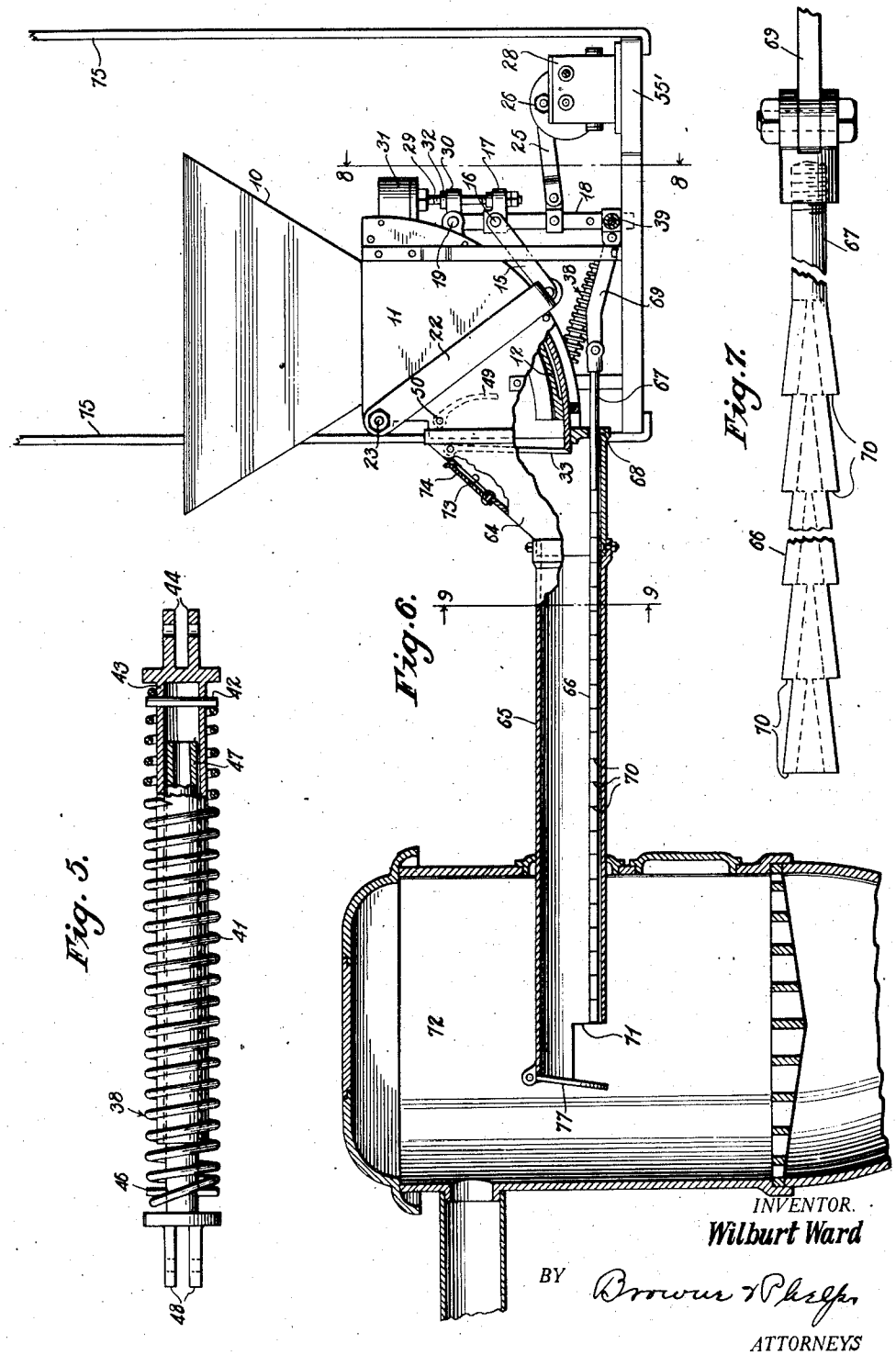


Fig. 5.

Fig. 7.

INVENTOR.
Wilburt Ward
BY Brown & Sheffield
ATTORNEYS

April 24, 1928. 1,667,230

W. WARD

STOKER AND THE LIKE

Filed June 20, 1927 4 Sheets-Sheet 4

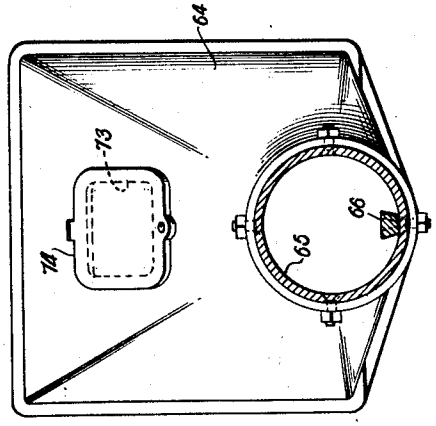


Fig. 9.

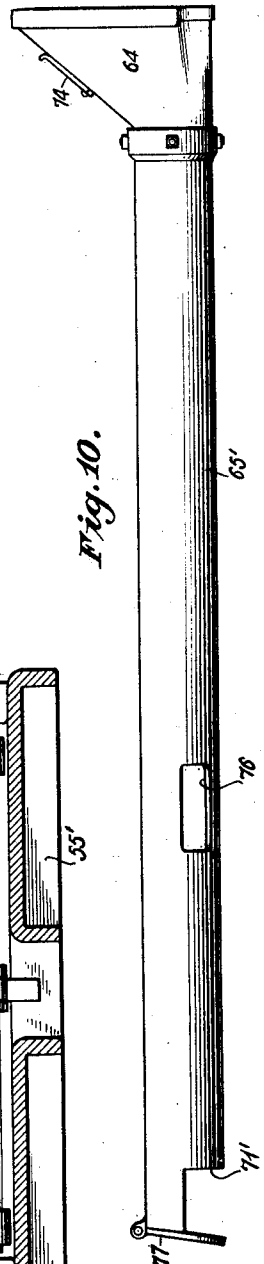


Fig. 10.

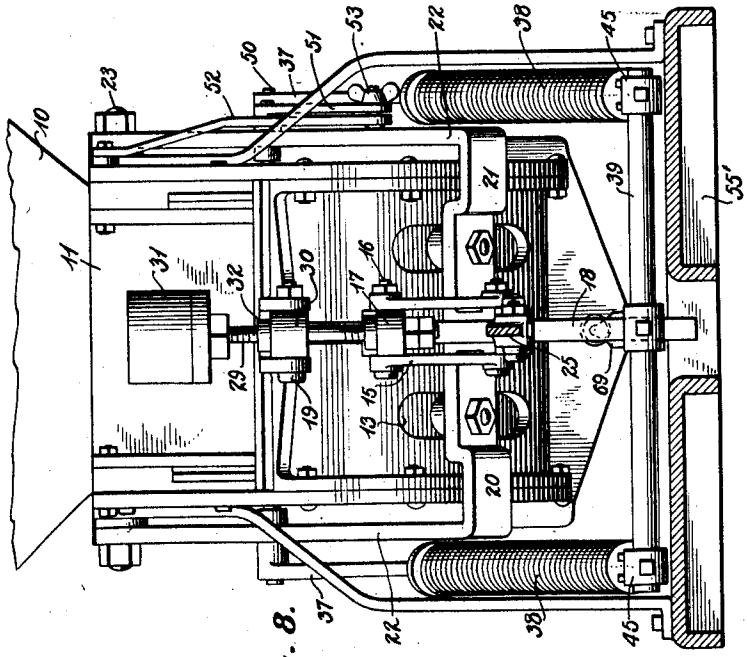


Fig. 8.

INVENTOR.
Wilburt Ward
BY Browne & Pugh
ATTORNEYS

Patented Apr. 24, 1928. 1,667,230

UNITED STATES PATENT OFFICE.

WILBURT WARD, OF FOREST, OHIO.

STOKER AND THE LIKE.

Application filed June 20, 1927. Serial No. 199,933.

The invention relates to stokers or the like and has as an object the provision of means for feeding coal to furnaces in small quantities at a time or for feeding material to elevators gradually whereby to prevent clogging the elevator. It may also be used for drawing hot lime from a lime kiln continuously.

It is an object of the invention to provide a device of this character having a wide range of quantity adjustment.

It is a further object of the invention to provide a device of this character that will feed or pass minute quantites at a time without clogging.

Further objects of the invention will appear from the following description when read in connection with the accompanying drawings showing an illustrative embodiment of the invention and wherein:—

Figure 1 is a central section partly in elevation;

Fig. 2 is a face view of the parts shown to the right of the broken line 2—2 of Fig. 1, the parts to the left of this line being unbolted and removed;

Fig. 3 is a detail end elevation from the right in Fig. 1;

Fig. 4 is a detail elevation of the discharge opening seen as in Fig. 2 showing filler plugs in place;

Fig. 5 is a detail plan view of a connecting link partly broken away and shown in section;

Fig. 6 is a side view partly in central vertical section of a modified form;

Fig. 7 is a plan view upon an enlarged scale of the fuel agitator and feeder of Fig. 6;

Fig. 8 is a detail section on line 8—8 of Fig. 6 shown partly in elevation;

Fig. 9 is a detail vertical section on line 9—9 of Fig. 6 upon an enlarged scale and

Fig. 10 is a detail side elevation of the discharge chute of Fig. 6 showing a modified form.

As shown in Figures 1 to 5, inclusive, the device comprises a hopper 10 delivering to a shovel box 11 having an arcuate shovel operating in its bottom, the bottom being shown open at 13 for the projection therethrough of the ears 14 carried by the shovel, to which ears there is connected a link 15 pivoted at 16 to a block 17 slidably mounted upon an arm 18 pivoted at 19 to a portion of the bottom of the box.

To cause movements of the shovel to take place upon the arc of a circle concentric with the bottom of the shovel box the ears 14 are shown as connected to cross-head members 20, 21, the ends of which members are connected to arms 22 pivoted to shaft 23 upon the center of the circle of which the shovel 12 is an arc.

To cause oscillatory movements of the shovel, the arm 18 is shown as connected by means of a link 25 to a crank 26 adapted to be operated through suitable reducing mechanism by means of a motor 27, the reducing mechanism being shown diagrammatically in Fig. 1 at 28.

To permit movements of the arm 18 in the event that the shovel 12 should be stalled, as by means of a chunk of iron getting into the box, without breakage of the parts, the slidable block 17 is shown as attached to a rod 29 slidable in a block 30 supported for movement about the axis 19. To cause the shovel 12 to operate under normal conditions the rod 29 is shown as carrying a weight 31 sufficiently heavy to insure that the shovel 12 shall operate but which weight will yield upwardly if the shovel is held stationary while the motor is still running.

The stroke of the shovel may be adjusted by adjusting a collar 32 upon the rod 29 which collar has screw-threaded engagement therewith, thus varying the position of the block 17 upon the arm 18 when the weight is down.

To prevent gases from escaping through the shovel box, there is shown a seal gate 33 pivoted at 34 upon a shaft 35 passing through the walls of the delivery box 36, which shaft has rigidly secured thereto arms 37 having their ends connected to links 38 shown in detail in Fig. 5, the other ends of the links 38 being connected to a cross-head 39 pivoted to the lower end of the arm 18 as at 40.

The links 38 are shown as transmitting their power to springs 41, as shown in Fig. 5, one end of spring 41 abutting and interlocking with a collar 42 carried by tubular member 43 having bifurcated end 44 for connection with the cross-head 40 through the medium of short link 45 shown in Fig. 1. The other end of the spring 41 is shown as abutting against and interlocking with a pin 46 passing through rod 47 telescoping with the tubular member 43 and having at its ends bifurcated member 48 for connection to the arm 37.

With this structure the links 38 will transmit the ordinary amount of power for operation of the seal gate 33 to cause the gate to open as the shovel 12 feeds fuel forwardly but the spring 41 will yield if the gate becomes clogged.

To provide an adjustable throat for the shovel box 11, there is shown a flap 49 hinged upon a shaft 50 journalled in the walls of the shovel box, the shaft 50 having an arm 51 connected to a link 52 by means of a stud bolt and wing nut 53 working in a slot 54 in the link 52 whereby the position of flap 49 may be adjusted.

In the form of Fig. 1, the shovel is shown as delivering to a chute 54 which may have a suitable form of fuel spreader (not shown) at its outlet. This form of device is shown supported by means of a bed 55 and a strut 56. The chute 54 is shown as attached to the shovel box 11 by means of bolts 57 and 58 which may be removed when the form of the device shown in Figures 6 et sq. is to be substituted.

To prevent access of material fed by shovel 12 to the edges of the shovel, the box 11 is shown as formed upon its inner walls with channels 59, within which channels lips 60 formed upon the upper surface of the shovel at its edges are received. To reduce the cross-sectional area of the shovel box at its bottom when small amounts of material are to be delivered, filler blocks 61 are shown which may be secured to the walls of the box by means of screws 62.

When the device is to be used with a furnce which must be fed from the side as distinguished from the overhead feed of Fig. 1, the form of the device shown by Figures 6 to 10 inclusive may be utilized. As there shown the box 36 is removed and the member 64 is bolted on in its stead, which member 64 is shown as connected with a tubular member 65 into which the shovel 12 delivers material. To agitate fuel delivered to the tubular member 65 by the shovel, there is shown a feeder 66, shown in detail in Fig. 7, having a rod-like portion 67 passing through an opening 68 in the bottom of the end wall of the member 64 and connected by means of a link 69 to the lower end of the arm 18. The agitator is shown as formed with a series of shoulders 70 adapted when the agitator is reciprocated to feed fuel forwardly to an opening 71 in the end of a chute from whence the fuel may fall into the furnace, illustrated diagrammatically at 72. By means of this form of device quantities of fuel as small as two ounces per minute may be fed.

To cool the tube 65, there is shown an opening at 73, adapted to be closed by means of a damper 74, whereby air is admitted to the tube and drawn therethrough by the draft of the furnace.

The form of device of Figures 6 to 10 inclusive is particularly suitable for stoking the dwelling type of furnace. For this use the device as shown in Fig. 6 is desirably suspended from the ceiling of the basement as by means of hangers 75 supporting the bed 55′ upon which the stoker is mounted.

When the grate to which fuel is to be fed is too long to successfully be fed at its center only, the form of chute 65′ of Fig. 10 may be utilized which is formed with an opening 76 intermediate its length which may discharge some of the fuel upon one portion of the grate while the opening 71′ discharges fuel at another portion of the grate. The chute 66 is shown as provided with a flap 77 to prevent excessive admission of gases of combustion to the chute.

The operation of the device will be clear from the above description. Minor changes may be made in the physical embodiment of the invention within the scope of the appended claims without departing from the spirit thereof.

I claim:

1. A stoker comprising in combination, an oscillating feeder, driving means for said feeder comprising a pivoted arm, a block slidable on said arm, a link connected to said feeder and said block, means to preserve the position of said block on said arm during normal operation of the feeder, said last named means yielding to permit said block to slide when the feeder is stalled during oscillation of the arm and means to oscillate the arm.

2. A stoker comprising in combination, an oscillating feeder, driving means for such feeder comprising a pivoted arm, a block slidably mounted on said arm, a link pivotally connected with said block and to said feeder, a block pivotally mounted upon the axis of said arm, a rod slidably mounted in said last named block and rigidly secured to said first named block, a weight mounted on said arm and means to oscillate said arm whereby when said feeder is stalled during oscillation of said arm, said slidable block may lift said weight to allow continued oscillation of said arm.

3. A stoker comprising in combination, an oscillating feeder, a throat through which material is fed by said feeder, driving means for said feeder comprising an oscillating arm, a link connecting said arm with said feeder, a seal gate for said throat, a link connected to said arm for oscillating said seal gate in synchronism with the movement of said feeder.

4. A stoker comprising in combination, an oscillating feeder, a throat through which material is fed by said feeder, driving means for said feeder comprising an oscillating arm, a link connecting said arm with said feeder, a seal gate for said throat, a link con-

nected to said arm for oscillatitng said seal gate in synchronism with the movement of said feeder, means whereby said link may be resiliently lengthened or shortened upon stalling of said seal gate during operation of said arm.

5. A stoker comprising in combination, an oscillating feeder, means for driving said feeder, a throat through which material is fed by said feeder a gate for controlling the opening of said throat, said gate journalled upon a shaft mounted in the wall thereof, an arm mounted on said shaft forming a bell crank with said gate, a link pivoted exteriorly of said throat connected to said arm and means for adjusting said connection whereby to vary the opening of said throat.

6. A stoker comprising in combination, an oscillating feeder, means for driving said feeder, a throat through which material is fed by said feeder, a tubular member connected to the wall of said throat, a material agitator and feeder reciprocably carried by said tubular member, means for reciprocating said last named means by the driving means of said feeder.

7. A stoker comprising in combination, an oscillating feeder, a tubular member to which material is fed by said feeder, a material agitator and feeder reciprocably carried by said tubular member comprising an elongated member having forwardly directed shoulders upon its surface, means for simultaneously driving said first named feeder and said agitator and feeder whereby to advance material through said tubular member.

8. A stoker comprising in combination, an oscillating feeder, a tubular member to which material is fed having a delivery opening at its end and a second opening intermediate its length for delivery of a portion of the material advanced through said tubular member, a material agitator and feeder reciprocably carried by said tubular member, means for driving both said feeding members in common.

9. A stoker comprising in combination, a feeder box having grooves adjacent the lower edges of the walls thereof, an oscillating shovel having ridges entering said grooves to prevent escape of material about the edges of the shovel and means for oscillating said shovel in the bottom of said box.

10. A stoker comprising in combination, a material receiving box, a shovel oscillatably mounted in the bottom of said box, means for varying the cross-sectional area of said box comprising filler blocks removably secured to the lower portion of the walls of said box.

11. A stoker comprising in combination, a material receiving box having an arcuate bottom, an arcuate shovel oscillating in said bottom, a link connected to said shovel and pivotally mounted upon an axis at the center of said arc, means for oscillating said shovel about said center concentric with the bottom of said box.

WILBURT WARD.