Feb. 23, 1926.

1,574,437

S. C. MARTIN

FUEL TREATING DEVICE

Filed Feb. 25, 1922

5 Sheets-Sheet 1

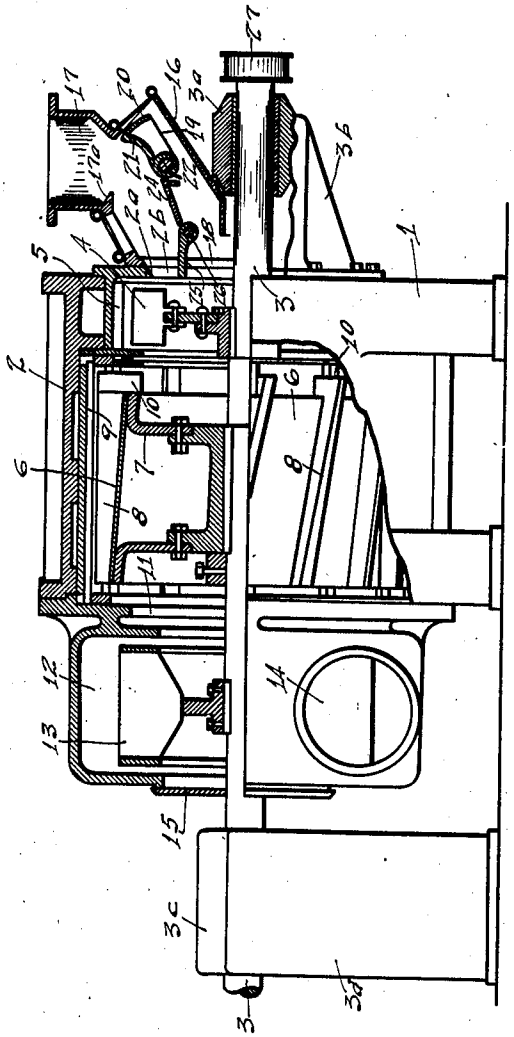

Fig. 1

Stanton C. Martin

INVENTOR.

BY

W. R. Lind

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Feb. 23, 1926. 1,574,437

S. C. MARTIN

FUEL TREATING DEVICE

Filed Feb. 25, 1922 5 Sheets-Sheet 2

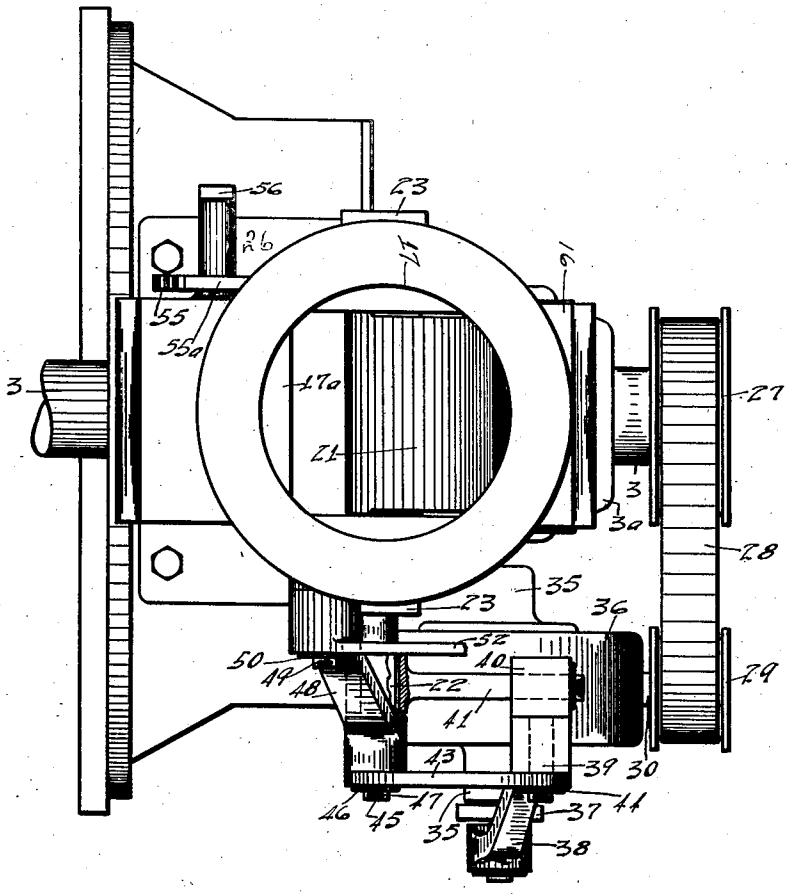

Fig-2

Stanton C. Martin INVENTOR.

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Feb. 23, 1926.

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S. C. MARTIN

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5 Sheets-Sheet 3

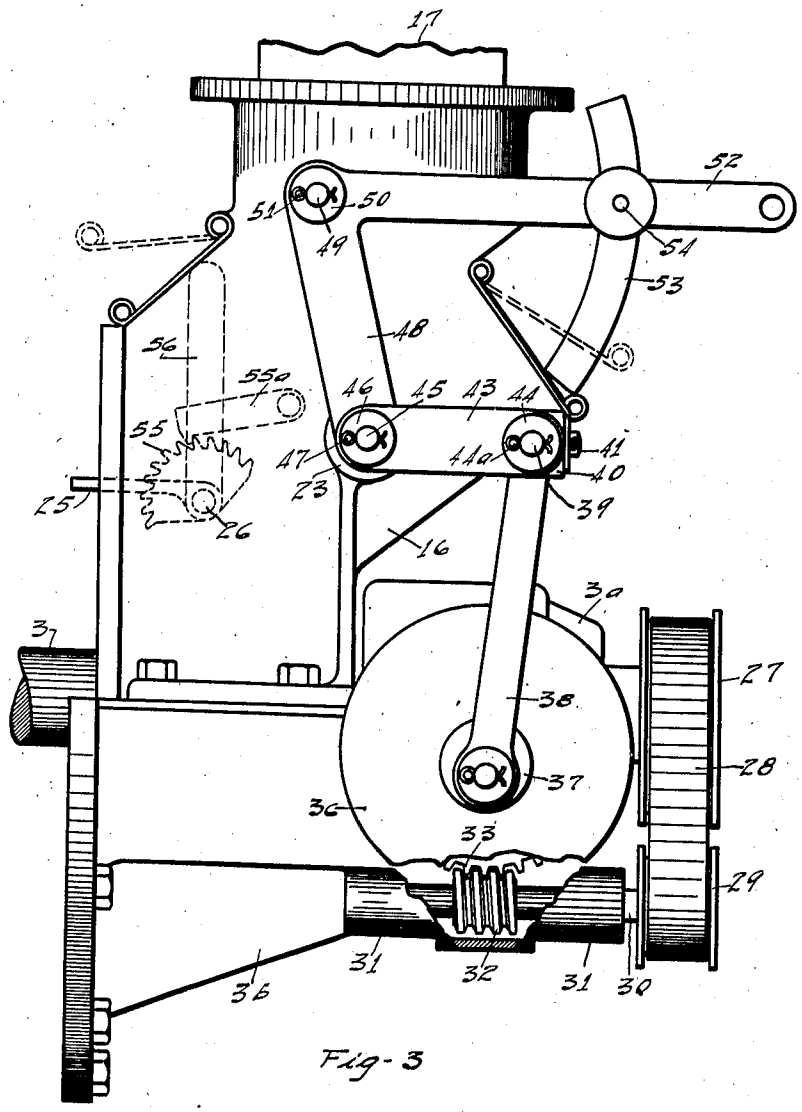

Fig-3

Stanton C. Martin INVENTOR.

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Feb. 23, 1926.

1,574,437

S. C. MARTIN

FUEL TREATING DEVICE

Filed Feb. 25, 1922

5 Sheets-Sheet 4

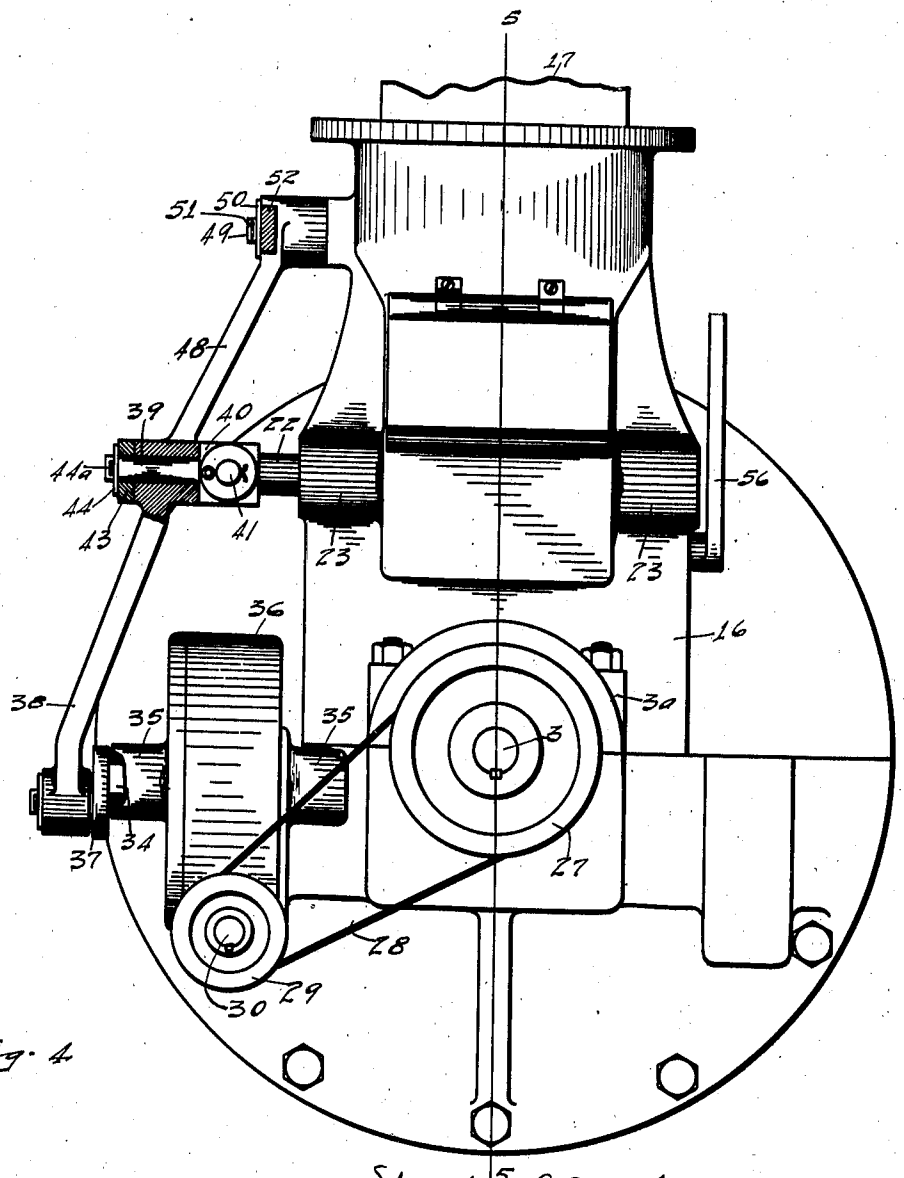

Fig. 4

Stanton C. Martin INVENTOR.

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Feb. 23, 1926. 1,574,437

S. C. MARTIN

FUEL TREATING DEVICE

Filed Feb. 25, 1922 5 Sheets-Sheet 5

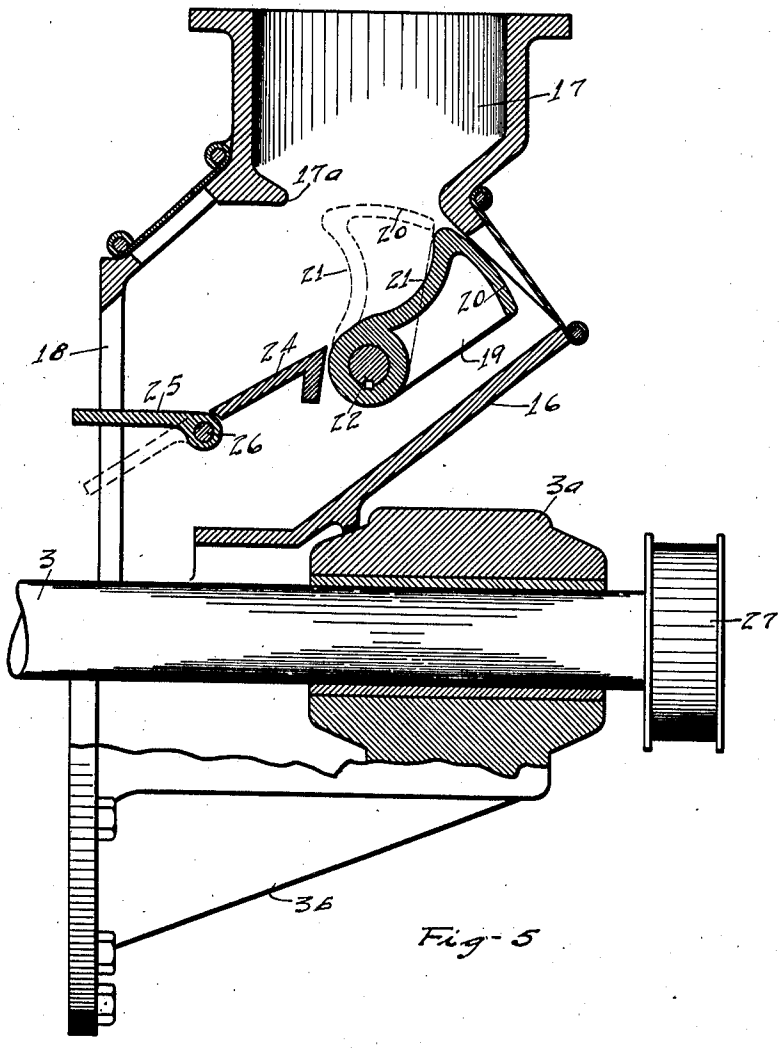

Fig-5

Stanton C. Martin INVENTOR.

BY

W. Reed ATTORNEY.

Patented Feb. 23, 1926. 1,574,437

UNITED STATES PATENT OFFICE.

STANTON C. MARTIN, OF ERIE, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO ERIE CITY IRON WORKS, A CORPORATION OF PENNSYLVANIA.

FUEL-TREATING DEVICE.

Application filed February 25, 1922. Serial No. 539,188.

To all whom it may concern:

Be it known that I, STANTON C. MARTIN, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented new and useful Improvements in Fuel-Treating Devices, of which the following is a specification.

This invention is designed to treat fuel and is particularly advantageous in pulverizing fuel and delivering the same directly to the furnace for combustion. With devices of this type difficulty has been experienced in delivering the desired quantity of fuel with uniformity and this difficulty is particularly manifest where there are wide variations in the kinds of fuel and in the condition of the fuel.

The invention is illustrated in the accompanying drawings as follows:—

Fig. 1 shows an elevation, partly in section, of a pulverizer with a feeding device in place thereon.

Fig. 2 a plan view of the feeding device.

Fig. 3 is a side elevation of the feeding device.

Fig. 4 an end elevation of the feeding device.

Fig. 5 a section on the line 5—5 in Fig. 4.

1 marks the frame of the pulverizing chamber, 2 a cylindrical shell, 3 an operating shaft, 3^a a bearing in which one end of the shaft is journaled, this bearing being carried by a bracket 3^b, and 3^c a bearing for the opposite end of the shaft 3, this being carried by a post 3^d. A breaker chamber 5 is arranged in the inlet end of the pulverizer and breaker blades 4 operate in this chamber, these blades being mounted on the shaft 3. The material is broken into small particles and then carried into the pulverizer. A drum 6 is arranged in the pulverizer chamber. This is carried by a web 7 mounted on the shaft 3. Blades 8 are mounted on the drum and the material is thrown against the attrition surfaces 9 by the rapidly rotating blades 8. A current of air is delivered through the machine by fan blades 10. The material is delivered through an opening 11 to a low pressure fan chamber 12. A fan 13 of large volume of smaller diameter than the fan 10 is arranged in the chamber 12 and drives the material through a passage 14 to a point of combustion. A shutter 15 is provided by means of which additional air is admitted to the chamber 12. The details of the construction of this pulverizer do not form the subject matter of this invention. The fuel feeder has a case 16. This is provided with an inlet passage or receptacle 17 and a discharge opening 18 leading into the breaker chamber 5 through an opening 2^b in the end 2^a of the breaker chamber, the case 16 being secured to the end 2^a by any convenient means. A valve and forcing blade 19 has the closure surface 20 and the forcing surface 21. This blade is mounted on a shaft 22. The shaft is journaled in bearings 23 in the case. This device is oscillated and as it moves forward tends to crowd whatever material may have dropped from the receptacle or inlet 17 forward. As the surface 20 moves forward it tends to close the receptacle 17 and thus restrict the movement of material. The receptacle 17 has a restriction 17^a at its bottom which operates in connection with the surface 20. The material as it is forced forward or moves forward is deposited on a supporting plate 24 which is set at sufficient inclination to permit some material to move forward by gravity. Immediately in front of the supporting plate 24 there is a tilting platform 25 forming a part or continuation of the support 24, the support being off-set from the inlet opening to retard the movement of material and direct the same into the end of the breaker chamber. The walls of the chamber above the support are spaced from the support to permit the material to flow to its angle of repose from the projection 17^a to the support or platform. This platform is mounted on a shaft 26 journaled in the case and may be adjusted to adapt the feeding device to different types and conditions of material.

The mechanism for operating the valve and forcing blade 19 is as follows:—A pulley 27 is fixed on the end of the shaft 3. A belt 28 extends from the pulley 27 to a pulley 29. The pulley 29 is fixed on a shaft 30. The shaft 30 is journaled in bearings 31 on the bracket 3^b. A worm 32 is fixed on the shaft 30 and meshes with a worm gear 33. The worm gear is fixed on a shaft 34. The shaft 34 is journaled in bearings 35 at the sides of a housing 36 arranged over a gear 33 and mounted on the bracket 3^b. A crank 17 is fixed on the shaft 34. A pitman

38 extends from the crank 37 to a pin 39. The pin 39 extends from a block 40 which is slidingly mounted on an arm 41. The arm 41 is fixed on the shaft 22. A link 43 is arranged on the outer end of the pin 39 and held in place by a plate 44 secured by a cotter pin 44a. The link 43 extends to a pin 45 extending from an arm 48, and is held in place thereon by a washer 46 and cotter pin 47. The arm 48 is mounted on a pin 49 extending from the case and is locked on the pin by a washer 50 and cotter pin 51. An operating handle, or lever 52 extends from the arm 48 and traverses a segment 53. A locking screw 54 is arranged on the arm by means of which the arm may be locked in any position along the segment desired. It will readily be seen that as the block 40 is moved inwardly and outwardly on the arm 41 by the action of the link under the control of the lever 48—52 the throw of the shaft 22 is increased or diminished accordingly. It will be observed that this change may be readily accomplished with the machine in operation and inasmuch as this varies the maximum opening of the valve surface the amount of material fed from the inlet receptacle may be thus varied.

A toothed wheel 55 is fixed on the shaft 26 at the outside of the case and a dog 55a operates to lock this toothed wheel in any position desired, a lever 56 being provided to throw the shaft to the position desired. By varying the position of the tilting platform 25 the initial movement of the material may be increased or decreased, the tilting platform retarding to a greater or less extent the inflow of material according to its position.

It will be noted that the arm 41 in its lower position is approximately at right angles to a radial line from the crank 37 so that while the throw of the valve may be varied the initial position of the valve remains practically constant giving a full opening to the receiving receptacle 17.

It will be noted, therefore, that there is a uniform opening and that the feeding is accomplished by varying the throw of the valve or plunger so as to vary the advance of the fuel incident to the throw of the valve.

What I claim as new is:—

1. In a fuel treating device, the combination of a fuel feeding device comprising a case having an inlet opening and a discharge opening; a normally stationary support in the case extending to an off-set position relatively to the inlet opening and positioned relatively to the walls of the case to permit the forward slope of material to find an angle of repose; means for adjusting the inclination of the discharge end of the support; and an oscillating means acting on the fuel at the inlet opening controlling and pushing the same forward over the support.

2. In a fuel treating device, the combination of a fuel feeding device comprising a case having an inlet opening and a discharge opening; a normally stationary support in the case extending to an off-set position relatively to the inlet opening and positioned relatively to the walls of the case to permit the forward slope of material to find an angle of repose; means for adjusting the inclination of the discharge end of the support; and an oscillating reciprocating means extending upwardly from its axis and operating at and transversely to the inlet for controlling the fuel and pushing the same forward over the support.

3. In a fuel treating device, the combination of a feeding device comprising a case having an inlet opening and a discharge opening; a support for receiving material from the inlet opening; and continuously actuating oscillatory reciprocating means extending upwardly from its axis operating at and across the inlet opening transversely across the inlet opening, said means permitting an intermittent flow of fuel and pushing the same forward from the inlet to the support.

4. In a fuel treating device, the combination of a fuel treating chamber comprising rotary beaters with a horizontal axis; a feed device comprising a case having an inlet opening and a discharge opening leading in an axial direction through the end of the chamber; a support in the case in position to receive material from an inlet opening; and means for intermittently pushing fuel forward from the inlet toward the support.

5. In a fuel treating device, the combination of a feed device comprising a case having an inlet opening and a discharge opening; a support in the case in position to receive material from the inlet opening; and continuously actuated oscillating means extending upwardly from its axis for and operating across the inlet opening intermittently pushing fuel forward from the inlet toward the support.

6. In a fuel treating device, the combination of a feeding device comprising a case having an inlet opening and a discharge opening; an oscillating means acting on the fuel and controlling the same; mechanism varying the throw of the means comprising an arm oscillating with the means; a sliding block on the arm; a crank; a link between the crank and block; and devices for adjusting the block on the arm.

7. In a fuel treating device, the combination of a feeding device comprising a case having an inlet opening and a discharge opening; an oscillating means acting on the fuel and controlling the same; mechanism varying the throw of the means comprising an arm oscillating with the means; a sliding block on the arm; a crank; a link between

the crank and block; and devices for adjusting the block on the arm, said devices being operable with the means in motion.

8. In a fuel treating device, the combination of a fuel feeder having an inlet opening and a discharge opening; a valved advancing device operating on the material at the inlet and forcing the same forward; mechanism for driving the device comprising an oscillating arm; a sliding block on the arm; a lever connection for operating the block to vary the throw of the arm; means operating on the block to oscillate the same; and means for locking the lever in adjusted position.

9. In a fuel treating device, the combination of a feeding device comprising a case having an inlet opening and a discharge opening; a support in the case adapted to receive material from the inlet opening; an oscillating means extending upwardly from its axis and with its upper face forming a valve adapted to move over the inlet opening to retard the fuel and its front acting as a forcing face moving with the valve adapted to advance fuel moving past the valve, said mechanism giving to the valve an approximately constant initial position as the throw is varied.

In testimony whereof I have hereunto set my hand.

STANTON C. MARTIN.