

April 10, 1928.

1,666,027

R. H. BEAUMONT

AUTOMATIC FUEL SUPPLY MEANS FOR BOILERS

Filed Oct. 7, 1926

4 Sheets-Sheet 1

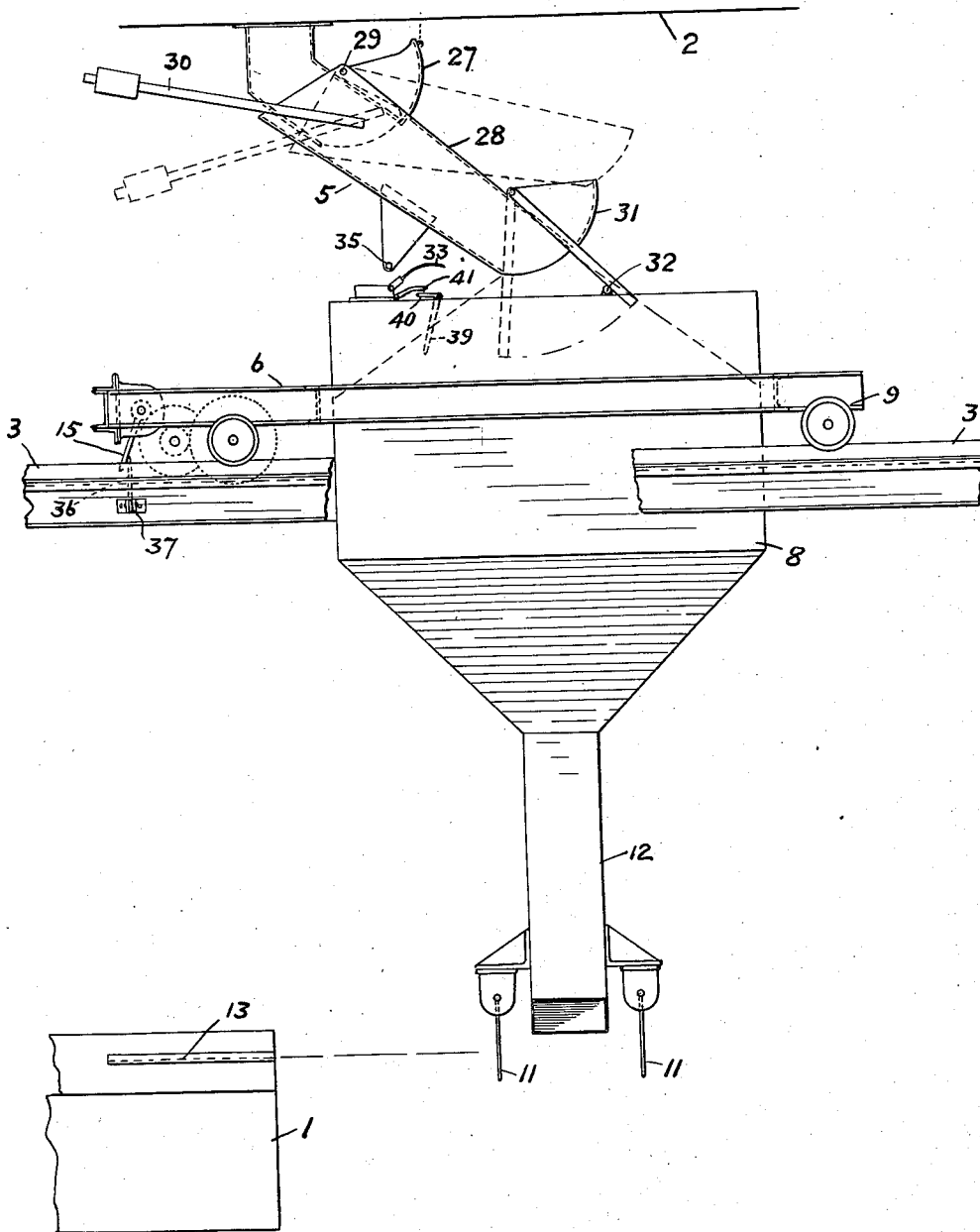


FIG. 1.

INVENTOR

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4 Sheets-Sheet 2

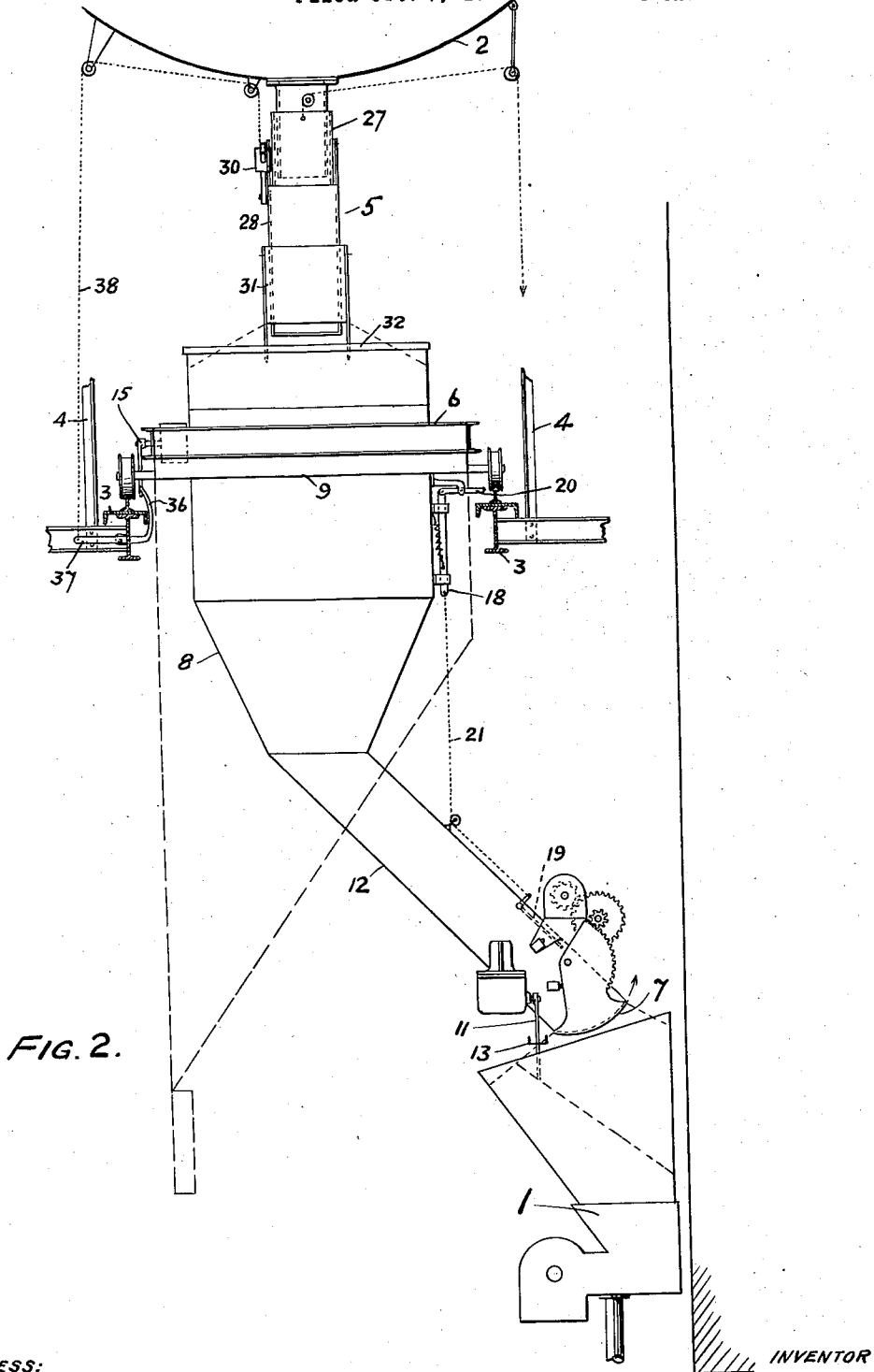


FIG. 2.

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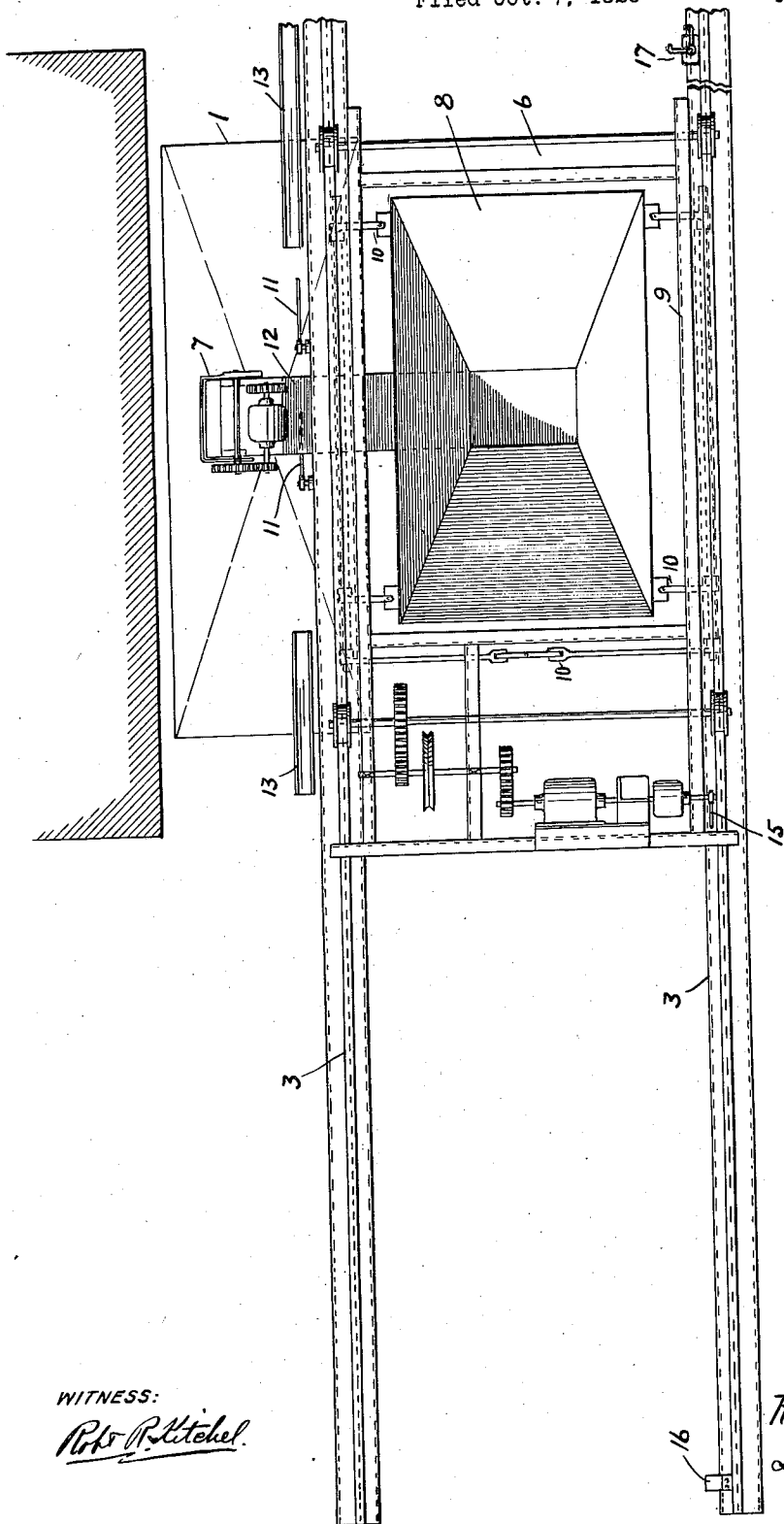


FIG. 3.

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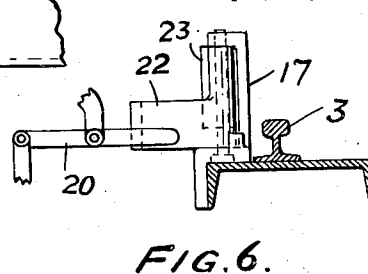
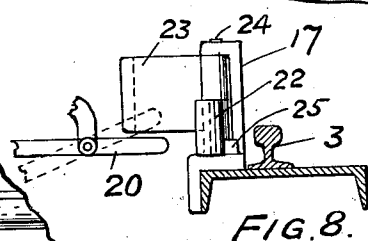
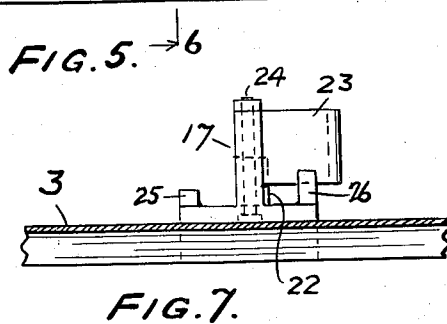
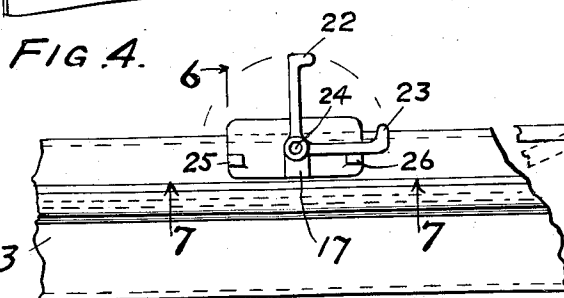
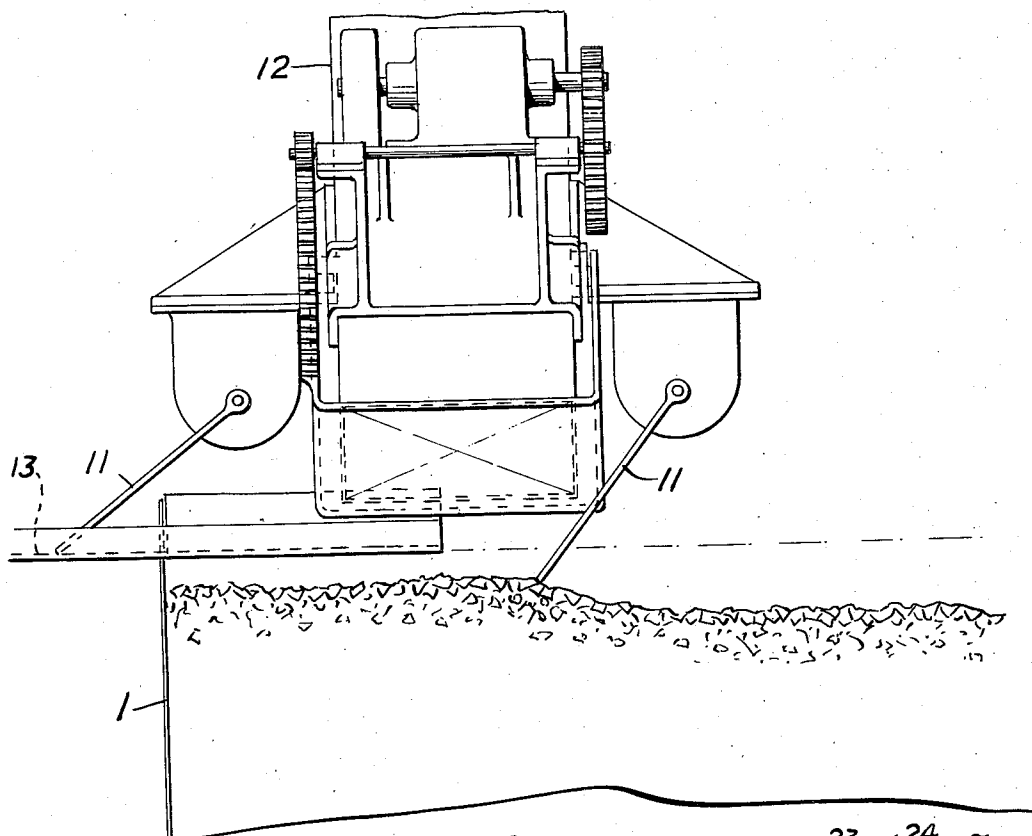
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AUTOMATIC FUEL SUPPLY MEANS FOR BOILERS

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4 Sheets-Sheet 4



WITNESS:

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FIG. 7.

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UNITED STATES PATENT OFFICE.

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AUTOMATIC FUEL-SUPPLY MEANS FOR BOILERS.

Application filed October 7, 1926. Serial No. 139,970.

The principal objects of the present invention are, first, to reduce the labor required for supplying fuel to boilers and at the same time to supply the boilers better and more evenly by reducing the personal element of attention; and second, to provide efficient, reliable and comparatively simple automatic fuel supply means for boilers which require very little attention in their operation.

Other objects of the invention will appear from the following description at the end of which the invention will be claimed. However, the invention will be described in connection with the accompanying drawings forming part hereof and in which

Figure 1 is an elevational view with parts broken-away of what may be regarded as the right hand end of the structure where one or more fuel bunkers are located and showing also the larry.

Fig. 2 is a cross sectional view showing one of the bunkers and also one of the boiler extension hoppers which are located toward the left and also showing the larry shifted to that location.

Fig. 3 is a top or plan view taken toward the left of the structure and showing one of the boiler extension hoppers and also showing the larry shifted to that position.

Fig. 4 is a view drawn to an enlarged scale and showing automatic mechanism for discharging from the larry chute.

Fig. 5 is a top or plan view illustrating an intermediate reversing switch.

Fig. 6 is a sectional view taken on the line 6-6 of Fig. 5.

Fig. 7 is a sectional view taken on the line 7-7 of Fig. 5, and

Fig. 8 is a view similar to Fig. 6 illustrating the parts in different positions.

In referring to the drawings please place Fig. 3 to the left of Fig. 1 with Fig. 2 in between because in that way the drawings are more easily understood. In the drawings 1 are boiler extension hoppers of which only one is shown but in large plants there are a number of them. 2 are chuted fuel bunkers of which only one is shown and they are horizontally spaced with relation to the boiler extension hoppers, for example, in the drawings the bunkers 2 are toward the right and the extensions 1 are toward the left and

the bunkers are at a higher level than the hoppers. 3 is a horizontal track which may be supported from above as by means of supports 4. This track is arranged beneath the chutes, generally indicated at 5, of the bunkers and above the extension hoppers 1. 6, generally, is a motor driven chuted larry arranged on the tracks 3 and provided with a motor operated gate 7, Fig. 2. The hopper 8 of the larry is suspended from the wheeled truck 9 of the same by scale mechanism 10, Fig. 3, so that the contents of the larry can be weighted. 11 are pendulum switches suspended from the chute 12 of the larry 6, and they are adapted to stop and start the motor which operates the gate 7 of the chute 12 of the larry 6. 13 is a guide on which the pendulum switches ride keeping the gate 7 closed, and this guide is interrupted at the boiler extension hoppers, Fig. 4, to permit said pendulum switches to operate at low fuel level in the boiler extension hoppers to open the gate 7. When the pendulum switches are at high level on the guide 13 or on the surface of the fuel, the gate 7 is kept closed, but when one of these pendulum switches drop the gate 7 is open and remains open until both of these switches are turned either by riding onto the guide or onto freshly supplied fuel. It will be understood that either of the pendulum switches operates to cause the gate 7 to be opened, but both switches must be up to close gate. 15 is a reversing switch mechanism carried by the larry 6 for reversing the direction of its travel. 16 is a trip, Fig. 3, on the track at the boiler extension hopper end of the travel of the larry toward the left and it operates to set the reversing switch 15 which remains, by reason of its construction and design, in set position until again shifted. 17, Figs. 3 and 5 to 8, is an intermediate reversing switch arranged on the track between the boiler extension hoppers and the bunkers and it is adapted in one position to act on the larry reversing switch 15 and send the larry back to the boiler extension hoppers, and in the other position to let the larry go through to the bunkers. 18, generally, is mechanism carried by the larry chute 12, Fig. 2, and it is responsive to depletion of the fuel supply and it is adapted to open and reset the intermediate reversing

switch. The two-armed plate 19, Fig. 2, pivoted at the wall of the chute 12, Fig. 2, is held in the position shown when the chute 12 contains fuel, but in the absence of fuel it falls vertically. In the position shown the pivotal dog 20 is in such position that its free end may be said to be down and when the plate 19 hangs down the free end of the dog 20 is up. The dog 20 and projecting arm of the plate 19 are connected as by a chain 21. The intermediate reversing switch, Figs. 5 and 6, comprises arms 22 and 23 rigid in respect to each other and as a unit pivoted at 24 to a stand having limit stops 25 and 26. It may be said that in Fig. 5 the switch is shown in thrown position. The arm 23 is higher than the arm 22 both at the top and bottom. The dog 20 is in the lead of the reversing switch 15 on the larry and in respect to the intermediate reversing switch. Assuming that the arm 23 is at right angles to the track, the dog 20 if in down position, as shown in Fig. 8 in full lines, runs under the arm 23, and the switch 15 runs into the high arm 23 which possesses sufficient friction to remain at rest and to turn the switch 15 toward the left in Fig. 1, thereby reversing the direction of travel of the larry. However, if the dog 20 is in up position, as shown by dotted lines in Fig. 8, it collides with the high arm 23 and turns the same into the position shown in Fig. 5, with the result that the switch 15 runs free from the top of the low arm 22 and the larry therefore continues to travel toward the right. Upon the return or left hand travel of the larry, the dog 20 will be down for reasons hereinafter explained, and it will collide with the low arm 22 and reset the intermediate reversing switch. The bunker chute is fitted with a manually operated cutoff gate 27, and it includes a section 28 pivoted at 29, and counterweighted at 30, and the pivotal section 28 is provided with a discharge gate 31. If we assume that the pivotal section 28 is down as shown in full lines, the larry, Fig. 1, moving toward the right runs under the chute 28 with the result that the provision 32 on the larry opens the gate 31, and the element 33 of the stopping and starting switch on the larry running under a projection 35 on the chute stops the larry. At about the same time the reversing switch 15 is set to start the larry toward the left. The reversing switch 15 is set by contact with one arm 36 of a centrally pivoted lever arranged on the track and having its other arm 37 connected by a cord 38 with the counterweight arm 30. The two-armed plate 39 carried by the larry normally occupies the position shown in Fig. 1, but when the larry is full of fuel, this plate 39 is turned in such a way that its arm 40, contacting with the element 41 of the starting switch

of the larry, starts the latter on its travel toward the left.

The mode of operation may be described as follows:

Fuel is supplied to the bunkers 2 of which there may be several, and it is conveyed by the larry to the boiler extension hoppers 1. Assuming that the larry is full of fuel, it travels back and forth between the intermediate reversing switch 17 and the track trip 16, discharging fuel into the stoker hoppers which require refilling automatically through the instrumentality of the pendulum switches 11. However, when the larry hopper is empty, through the instrumentality of the plate 19 and its connections, the intermediate reversing switch 17 is opened and the larry goes through to the bunkers, and if the bunkers which it first approaches are empty their chutes are in up position as shown by dotted lines in Fig. 1, so that the larry proceeds until it encounters a bunker chute that is down, then through the instrumentality of the elements 32 and 35, the larry is stopped under the chute and receives a supply of fuel. When it is full the fuel, acting on the element 39, starts the larry back toward the boiler extension hoppers because the switch 15 has been properly positioned to accomplish that result by the arm 36, and because the starting element 41 has been operated by the arm 40. By a repetition of the described travel of the larry and operation of the parts, fuel is taken from the bunkers automatically and automatically supplied to the extension hoppers.

It will be obvious to those skilled in the art to which the invention relates that modifications may be made in details of construction and arrangement and in matters of mere form without departing from the spirit of the invention which is not limited to such matters or otherwise than the prior art and the appended claims may require.

I claim:

1. Automatic fuel supply means for boilers comprising a track, bunkers arranged above and toward one end of the track and having pivotal chutes, boiler hopper extensions arranged below and toward the other end of the track, a power driven larry having a power operated discharge gate, means on the larry responsive to a depleted hopper supply and adapted to open the larry discharge gate, trip and intermediate switch mechanism for causing the larry to travel back and forth over the hoppers, mechanism on the larry responsive to its fuel supply and adapted to set the intermediate reversing switch to let the larry go through to the bunkers, mechanism responsive to a depressed bunker chute and adapted to stop the larry and to set its switch mechanism ready for travel toward the hoppers, and

devices responsive to the contents of the larry for starting it in the last named direction.

2. Automatic fuel supply means for boilers comprising a track, bunkers arranged above and toward one end of the track and having pivotal chutes, boiler hopper extensions arranged below and toward the other end of the track, a larry having starting and stopping and reversing switches and provided with a power operated discharge gate, means responsive to depleted boiler hopper fuel supplies and adapted to open and to close the larry hopper gate, a trip and an intermediate reversing switch on the track at the limits of travel of the loaded larry and adapted for cooperation with the larry reversing switch, means on the larry responsive to depletion of its load and adapted to throw out the intermediate reversing switch and let the larry go through to the bunkers, and mechanism operated by the bunker chutes when depressed and adapted to stop and fill and reverse and start the larry back to the boiler hopper.

3. Automatic fuel supply means for boilers comprising a track, bunkers at and above one end of the track, boiler hoppers at and below the other end of the track, a power driven larry, automatic means for causing the loaded larry to travel back and forth over the hoppers and to keep them supplied with fuel, and automatic mechanism for causing an unloaded larry to travel to a full bunker and to be loaded therefrom and to go back to the boiler hoppers.

4. Automatic fuel supply means for boilers comprising boiler extension hoppers and chuted fuel bunkers in horizontally spaced relation and a horizontal track arranged beneath the bunkers and above the extension hoppers, a motor driven chute larry arranged on the tracks and provided with a motor operated chute gate, pendulum switches carried by the larry and adapted

to open and to close the larry chute gate, a guide on which the pendulum switches ride and which is interrupted at the boiler extension hoppers to permit said switches to operate at low fuel level in the boiler extension hoppers to open the larry chute gate, reversing switch mechanism carried by the larry for reversing the direction of its travel, a trip on the track at the boiler extension hopper end of the larry travel for setting the larry reversing switch, an intermediate reversing switch on the track between the boiler extension hoppers and the bunkers and adapted in one position to act on the larry reversing switch and send the larry back to the boiler hoppers and in the other position to let the larry go through to the bunkers, mechanism carried by the larry chute and responsive to depletion of its fuel supply and adapted to open and to reset the intermediate reversing switch, a starting and stopping switch for the larry motor responsive to down position of a bunker chute to stop the larry and responsive to full contents of the larry to start the larry, means on the larry for opening the gate provided on the bunker chute, and devices arranged on the track and responsive to the down position of the bunker chute and adapted to operate the larry reversing switch to send the larry back to the boiler extension hoppers.

5. In automatic fuel supply means for boilers, a track, bunkers above one end portion of the track, boiler hoppers beneath the other end portion of the track, a power driven larry having a reversing switch and a dog lifted and lowered in response to the contents of the larry, and a pivotal intermediate reversing switch having two arms in fixed relation and of which one is at a high level and of which the other is at low level, said arms arranged for cooperation with said larry reversing switch and dog.

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