

J. C. SCHAFER.
SUPPLY MECHANISM.
APPLICATION FILED JAN. 23, 1917

Patented Apr. 29, 1919.

1,301,978.

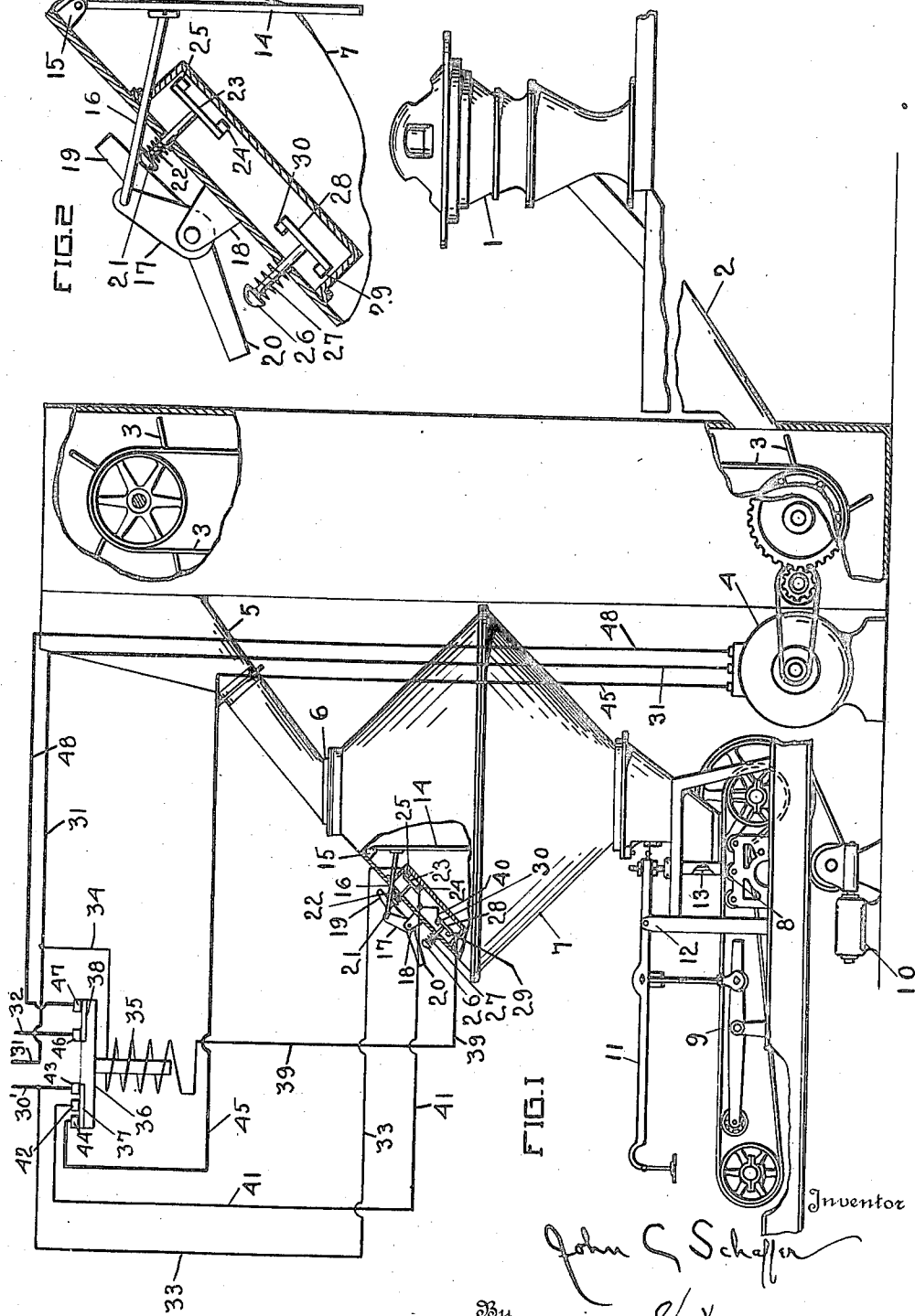


FIG. 1

FIG. 2

John C. Schaffer
Geoffrey

Inventor

Attorney

UNITED STATES PATENT OFFICE.

JOHN C. SCHAFFER, OF TIFFIN, OHIO.

SUPPLY MECHANISM.

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Specification of Letters Patent.

Patented Apr. 29, 1919.

Application filed January 23, 1917. Serial No. 144,096.

To all whom it may concern:

Be it known that I, JOHN C. SCHAFFER, a citizen of the United States of America, residing at Tiffin, Seneca county, Ohio, have invented new and useful Supply Mechanisms, of which the following is a specification.

This invention relates to the provision of a supply of material, especially for a continuous delivery device.

This invention has utility when incorporated as a feeding drive control for a uniform rate delivery device.

Referring to the drawings:

Figure 1 is a side elevation with parts broken away, of an embodiment of the invention for handling material fragments; and

Fig. 2 is a detail on an enlarged scale, with parts broken away, of the control connections.

In the operation of the device, say for handling earth products, as stone, the stone may be delivered to the crusher 1, discharging into the bin 2 as a storage before passing therefrom to the endless flight or bucket elevator or conveyer 3 driven by the motor 4. This elevator or supply means for the material has the spillway 5 to the intake 6 of the hopper 7 provided with the outlet 8 to the endless belt 9 normally continuously driven by the motor 10. This belt 9 has the beam 11 mounted on the fulcrum 12, through its operating connections effective to control the gate 13 at the outlet of the hopper 7 and thereby insure a constant weight rate of continuous delivery of material from the hopper 7 to such treating device or other material handling means as may be desired.

The supply means 3 in its normal operation has a capacity in excess of the determined continuous uniform delivery rate of the device 9; 10, 11, 12, 13, taking from the hopper 7. Accordingly, during the operation of the supply means 3, there is accumulation of material in the hopper 7. As the intake 6 is directed toward the vane 14 pivotally mounted on the bracket 15 in the hopper 7, the accumulation of material in the hopper 7 rising to the vane 14 is effective to actuate this vane 14 in swinging away from the center of the hopper, as well as away and up out of the accumulated material. In this swinging of the vane, accordingly there is no hindrance of vane action.

Connected to the back of the vane 14 is

the link 16 extending to the arm 17 carried by the bracket 18. Fast with the arm 17 are the arms 19 and 20. With the vane 14 swinging freely in the hopper 7, the link 16, through the arm 17 holds the arm 19 against the head 21 compressing the spring 22, thereby holding the bar 23 to short circuit between the terminals 24, 25. At this position of the armed member 17, 19, 20, the arm 20 is free from the head 26 so that the spring 27 is effective in holding the bar 28 to short circuit between the terminals 29, 30.

The currents supply to the motor 4 is determined through this controlling mechanism from the main feed lines 30', 31, 32. The line 31 goes directly to the motor 4. From the line 30' is the line 33 extending to the terminal 25 at the control mechanism. From the line 31 extends the line 34 to the solenoid 35 controlling the relay 36 having the conductor bars 37, 38. The circuit from the solenoid 35 extends by the line 39 to the terminal 29. Between the terminals 24 and 30 extends the line 40 having the branch extending to the terminal 42. With this solenoid 35 energized, the relay 36 is lifted against gravity and brings its contact bar 37 to abut the terminal 43 on the line 1 as well as contact the terminal 42 and the terminal 44. From the terminal 44 extends the line 45 to the motor 4.

This lifting of the relay 36 brings the conductor bar 38 into contact with the terminal 46 from the line 32, as well as into contact with the terminal 47 so that current supply from the line 32 may pass by the line 48 to the motor 4.

In operation, with the crusher 1 running or a reserve supply in the bin 2, material may flow to the supply means 3. With the supply means operating to conduct material to the hopper 7 via the intake 6, and with the uniform rate delivery device withdrawing material from the hopper 7, there is an accumulation of material in the hopper 7. During this accumulation of material before it rises to the vane 14, this vane is in the position shown in Fig. 1, and the current from line 31 passes directly to the motor 4. The electric current from line 31 and the line 34, through the solenoid 35, line 39, terminal 29, bar 28, terminal 30, line 40, terminal 24, bar 23, terminal 25, and line 33, completes the circuit to line 30', maintaining the solenoid 35 energized, and the relay 36 lifted against gravity. This insures

the supply of current to the motor 4, say from a three-phase supply direct through line 31; from line 30' by terminal 43, conductor bar 37, terminal 44 and line 45 to the motor 4; and as to the third line 32 via the terminal 46, conductor bar 38, terminal 47 and line 48 to the motor 4.

As the material accumulates in the hopper 7 to engage the vane 14, the spill of material from the intake 6 directly against this vane 14 causes it to swing outward and, through the link 16, arm 17, rocking arm 19 away from the head 21 so that spring 22 may lift the bar 23, to open the circuit between the terminals 24, 25. However, this opening of the circuit does not deenergize the solenoid 35 because this circuit through the solenoid 35 from line 34 to line 39, terminal 29, bar 28, terminal 30, and line 40 may pass through the line 41 to the terminal 42 and as the relay has been lifted the conductor bar 37 is effective to close the circuit from terminal 42 to terminal 43 to the line 30' which has had its circuit through line 33, broken by the arm 19.

As the vane 14 is further actuated, it is effective through the link 16, arm 17, and arm 20, to actuate the head 26 against the action of spring 27 for moving the bar 28 away from the terminals 29, 30. This opens the circuit through the solenoid 35 thereby deenergizing this solenoid that the relay 36 may drop from gravity and the conductor bars 37, 38, open the circuits from the lines 30' and 32, thereby stopping the motor 4.

As the continuous rate delivery device withdraws material from the hopper 7, the vane 14, by gravity, gradually swings back and with the arm 20 moving away from the head 26, the bar 28 again closes the circuit between the terminals 29, 30, but this is ineffective to energize the solenoid 35 because the line 41 to the terminal 42 may not close the circuit with the line 30' through the terminal 43 because the relay 36 is dropped and the conductor bar 37 is away from the terminals 42 and 43.

Further, swinging of the vane 14 will bring the arm 19 against the head 21, overcome the action of the spring 22 and force the bar 23 to contact the terminals 24, 25.

This is at once effective for closing the circuit from the solenoid 35 through line 39, terminal 29, bar 28, terminal 30, line 40 to the terminal 24 and thus by the bar 23 to the terminal 25 and line 33 to the line 30'. The solenoid 35 thus energized overcomes the resistance of gravity, rises to bring the conductor bar 37 into contact with the terminals 44, 42 and 43, and conductor bar 38 into contact with the terminals 46 and 47. The circuit from the two additional supply lines is thus completed so that with the supply line 31 direct to the motor 4, the motor 4 at once undertakes replenishment of material supply to the hopper 7, which replenishment at a rate greater than the draw-off rate of the uniform rate delivery device continues until the vane 14 is again actuated for a repetition of the cycle of intermittent operation. There is accordingly provided an automatic supply effective for rendering reliable operation over extended periods of time of the continuous rate delivery device.

What is claimed and it is desired to secure by United States Letters Patent is:

1. A feeder consisting of a uniform delivery conveyer, supply means therefor including a supply conveyer of greater capacity than the conveyer, a material reserve reservoir with a hopper between said supply and delivery conveyers, said reservoir having therein a movable device adapted to move away from material accumulating in said reservoir, and a controlling device operable by the movement of said movable device for controlling the operation of said supply conveyer.

2. A feeder comprising a uniform delivery conveyer, supply means therefor including a supply conveyer of greater capacity than the delivery conveyer, a material reserve reservoir with a hopper between said supply conveyer and said delivery conveyer, said reservoir having therein a suspended vane adapted to be moved by material accumulating in said reservoir, and a controlling device operable by movement of said vane for controlling the operation of said elevator.

In witness whereof I affix my signature.
JOHN C. SCHAFER.