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OPERATING DEVICE FOR THE CHARGING VALVES OF GAS PRODUCERS

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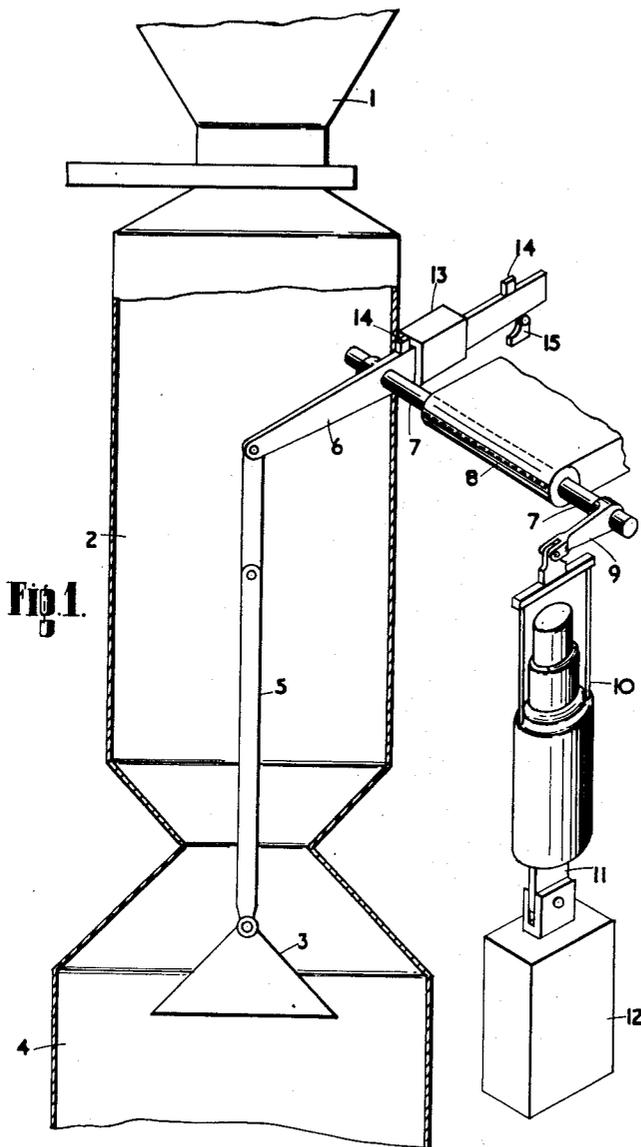
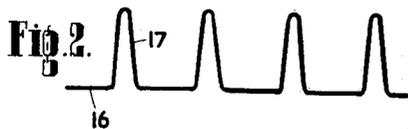


Fig. 1.



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# UNITED STATES PATENT OFFICE

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## OPERATING DEVICE FOR THE CHARGING VALVES OF GAS PRODUCERS

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1 Claim. (Cl. 214—36)

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The present invention relates to operating devices for the charging valves of gas producers, kilns and the like.

According to the present invention a closing impulse is imparted to the valve for a constant predetermined time in a recurrent time period by means of a periodically operated solenoid the power of which is sufficient only to operate the valve when free from charging material upon it. By this arrangement even if the valve is blocked for a short while it may still be operated if the blockage clears within the predetermined part of the time cycle.

A control device for the charging valves of furnaces is known in which the valve is connected to a periodically operated displacing member by a spring link, so that if the valve is prevented from closing by reason of material above it, the spring is compressed to a predetermined degree when a switch is operated to interrupt the operation of the displacing member until a fresh time cycle commences.

The invention is more particularly described with reference to the accompanying drawings, in which—

Figure 1 is a diagrammatic elevation of one arrangement as applied to gas producers.

Figure 2 is a time energy diagram.

Fuel such as coke from a fuel bunker 1 passes through a valve operated by hand or automatically into the charging chamber 2, the outlet from which can be closed when this chamber is empty and during its charging by means of a bell or valve 3 shutting off this charging chamber 2 from the producer chamber 4.

The valve 3 is connected by links 5 to the arm 6 of a pivoted lever mounted on the shaft 7 capable of turning in a fixed bearing 8, which shaft 7 has a crank arm 9 upon it connected to one element 10 of an electromagnet, the other element 11, to which the element 10 is relatively displaceable being attached to a fixed part of the frame 12.

The other arm of the lever 6 may have a weight 13 sliding freely along it by gravity between limited stops 14 such that when the valve 3 is in its uppermost position closing access from the charging chamber 2 to the producer 4 the end of this lever may close an electric switch 15, its movement being assisted by the sliding weight, which switch may either operate an audible or visible signal such as a bell or an electric lamp or additionally or alternatively thereto, may operate a relay circuit to open the valve between the fuel bunker 1 and charging chamber 2.

As will be seen from Figure 2 electric energy is passed to the electromagnet or solenoid 10, 11, at predetermined periods of time where 16 represents the rest periods and 17 the impulse periods. To produce the pulses the electrical cir-

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cuit can be opened and closed by a constant speed motor operated switch.

During each of the impulse periods 17, therefore, the element 10 will be thrust upwardly tending to close the valve 3 but should its closing be hindered by coke or other burden lying upon it the element 10 will be prevented from rising but no damage will result to the parts as this electromagnet 10, 11, will then act as an overload absorber. Normally the power of the electromagnet or solenoid arrangement 10, 11, will be such as will be sufficient to lift the valve 3 and maintain it closed when there is no restriction to its movement by reason of coke lying over it; the displacement of the valve 3 when free is facilitated by the sliding weight 13.

Further, if desired, catch means may be provided to lock the valve 3 in its raised position in which it closes the charging chamber during the charge of this, the catch being released when the chamber 2 has been filled with a predetermined volume of coke or the like material and the valve between the fuel bunker and the charging chamber 2 closed either by hand or automatically.

I declare that what I claim is:

An operating device for the charging valve of a gas producer comprising a valve, a solenoid, mechanical means interconnecting said valve and solenoid for opening and closing said valve by actuation of said solenoid, means for energizing said solenoid by continuous impulses to urge said valve to closed position during each impulse with a power sufficient to close said valve only when said valve is free of obstruction by charging material in said gas producer, and means responsive to the energizing of said solenoid for overcoming the weight of the valve to move it to closed position and when free of obstruction.

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