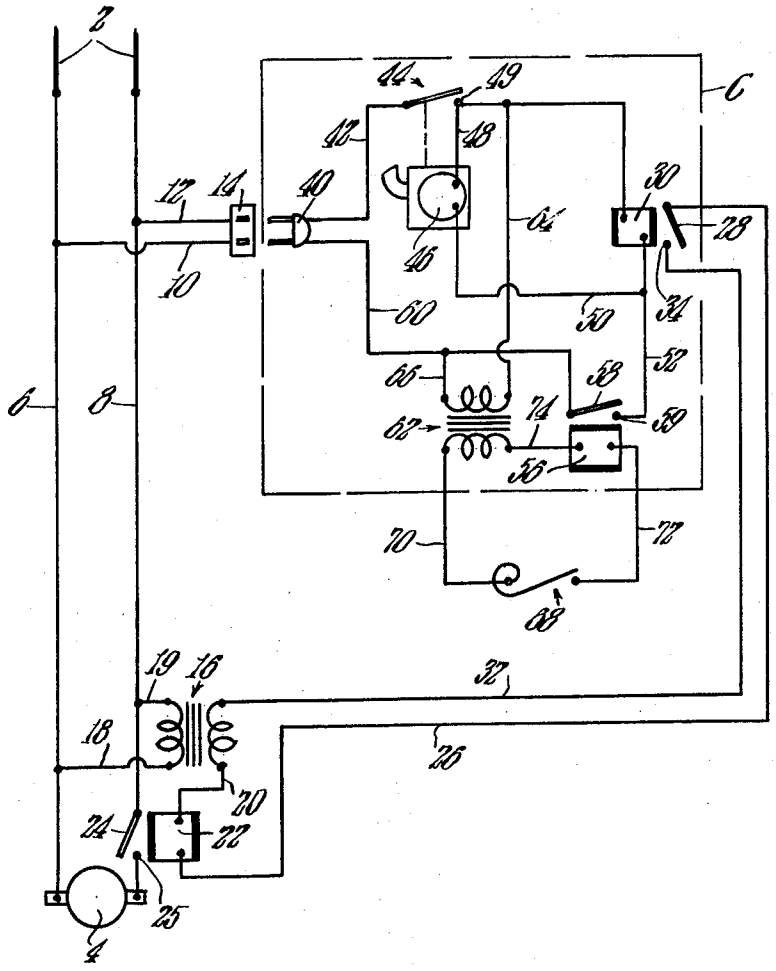
Dec. 15, 1959 R. H. POIRIER 2,917,149

CURRENT MEASURING CIRCUIT

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CURRENT MEASURING CIRCUIT

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1 Claim. (Cl. 194—9)

My invention relates to new and useful improvements in structural refinements in a coin-operated metering system for the dispensing of a commodity such as fuel oil, gas, electrical energy or the like. It is directed more particularly to the provision of a means for controlling an electrical circuit such as, for example, the electrical circuit of an oil burner, through a time controlled coin device. When and if the fuel oil consumed by the oil burner has not been paid for in advance by the consumer through the dropping of a coin or coins into the coin mechanism thereof, which mechanism is an integral part of the metering system, then the use or consumption of additional quantities of the fuel oil by the oil burner is prevented.

My invention has particular application for vendors of fuel oil who may desire to ensure prepayment for same as it is consumed by the oil burner in the building of the vendee.

The system has the unique advantage that it may be installed quickly and easily in the vendee's building, by the vendor, with a minimum of time and effort. Same can be accomplished without the necessity of extensive wiring into existing circuits with its attendant costs made necessary by the usually obligatory hiring of licensed electricians for accomplishing such work.

My invention resides in the particular arrangement, construction and relationship of elements of the metering system, all as disclosed in the accompanying description in which the objects of the invention will be apparent.

It is contemplated that the device hereof will be used to provide current for a given length of oil burner operating time upon the insertion of a coin or coins, of given denomination or value. The device may be used either in the sale of fuel oil as such, or may be used as an instrument in the collection of time payments in connection with the apparatus which consumes the fuel oil. The attachment of such a meter to an oil burner will force the customer to make payments for the fuel oil consumed thereby through the necessity of keeping the system supplied with coins in order to render the oil burner operable.

The device and/or system hereof offers the unique advantage that is, it is possible for the user of the commodity to pay for same in advance in such amounts and at such rates as he himself may determine.

The device and/or system is novel in that it satisfies a natural and normal desire on the part of some consumers, who object to monthly or other periodic billings, to pay for their commodity as they go.

The amount of the commodity, such as fuel oil, which is stored in the user's buildings, is charged to him, as is normal, and the amount or amounts deposited by the vendee and periodically collected by the vendor is or are credited to the vendor's account with the vendee.

It is of course desired by a vendor that a vendee keep his account current but in no event will the balance owed by the vendee equal the full amount due for a load of the fuel oil as it is normally charged the vendee until

said vendee actually consumes the fuel oil of the load thereof so stored.

According to the invention, a prepayment mechanism for fuel oil, gas, electricity or a like commodity is provided for the control of the supply of such commodity to a commodity-consuming mechanism in a domicile or the like which includes a motor for operating the commodity consuming mechanism, a power source for operating the motor, a coin controlled meter which is automatically operated by the insertion of a coin or coins for the purpose of conditioning the circuit by means of a normally open switch means which is movable into a closed position upon said insertion for energizing a relay and thereby closing an arm whereby the energization of a low voltage circuit is accomplished for the completion of a circuit to the motor, and timing means for opening the circuit and shutting off the motor by the deenergization of the relay according to the calls of the thermostat for oil burner operation and during the elapse of a period as determined by the value of the coin or coins inserted into the coin controlled means.

When it is desired to meter electric current for the operation of an oil burner on a time basis, an electric clock mechanism is activated by a system controlled by the coin or coins. The components thereof coact and cooperate in such a manner that the insertion of a coin activates the meter mechanism of the clock, with the clock being adapted to shut off the load current after a predetermined lapse of operating time according to the value of the coin or coins employed.

In other words, by the insertion of a coin of predetermined denomination, the timing motor and the oil burner motor start operating if, and only if, the thermostat is calling for heat. When the thermostat is satisfied, the timing motor and the oil burner motor are rendered inoperative to await further calls for operation by the thermostat.

The timing motor and hence the oil burner motor may operate so long as, and only so long as, any increment of time as represented in the payment by the consumer through his dropping a coin into the coin mechanism remains to the credit of the consumer.

It is the principal object of this invention to provide a novel and improved construction of the type in which a low voltage circuit relay, energized by the action of a coin or coins, will be kept in operative condition for a predetermined time interval or for a predetermined total of smaller time intervals so as to permit the operation of the oil burner connected thereto according to the call or calls for such operation by the oil burner's thermostat.

In this invention, there is the provision of an electrical circuit or system which will operate with a maximum amount of ease and with a minimum degree of effort, installationwise and operationwise.

Another object hereof is to provide a control device for the operation of an oil burner, which, upon insertion of a coin or coins, will operate, either continuously or at intervals, over a certain period of time according to the value of the coin or coins deposited and according to the demands for such operation as controlled by the thermostat connected to the oil burner.

A further object hereof is to provide a construction for association with an oil burner having coin controlled means controlling the operating time period for the oil burner irrespective of the amount of current consumed by the oil burner during the operating period.

It is another object hereof to provide an improved means of the above character which requires no winding or equivalent acts necessitating attention and/or maintenance. Only the insertion of the coin or coins is necessitated herewith.

It is another object hereof to provide a device for the

purpose stated above, which will retain the said electrical circuit relay as energized, without interruption to the electrical circuit controlled thereby, until the termination of a number of time intervals corresponding to the number and/or value of the coin or coins deposited in the clock device of the apparatus.

Still another object of the invention is to provide an improved timing system having a simple electrical switch mechanism which will function for long periods of time without the necessity of adjustment or repairs, which electrical switch, when closed by the deposition of a coin or coins, may be kept closed during an interval of time according to the calls of the thermostat for oil burner operation and also according to the value of the coinage deposited into the coin controlling device thereof.

Other more specific objects and advantages of the invention will be apparent upon a full understanding of the nature, relationship and purpose of the several cooperating parts of the apparatus as hereinafter recited.

One form of the invention is presented herein by way of exemplification. It will, of course, be appreciated that the invention is susceptible of embodiment in other modified forms coming equally within the scope of the appended claims. Although the invention has been described and illustrated herein with particular reference to an oil burner and its operation, it is to be appreciated that its utility and application extend beyond such a particular type of system and comprehend the useful and novel features set forth when combined with any commodity consuming mechanism of any type such as gas range, refrigerators, or the like.

The above objects and advantages of the invention reside in the features of novelty and details of construction and operation as more fully hereinafter pointed out with particularity in the claim annexed to and forming part of this description.

In the drawings:

The figure is a wiring diagram to explain the novel features of the invention.

In the following description and claim, various details will be identified by specific means for convenience. These names, however, are intended to be as generic in their application as the art will permit.

Referring now to the drawing, I have shown the usual power line which is represented by **2** and which may be a 110 volt A.C. circuit from a suitable source of electricity, as is commonly found in buildings employing motor-operated oil burners.

The supply voltage may, of course, be other than that herein specified.

The oil burner motor is represented by **4** and it may be in a location remote from or adjacent to the control mechanism of the invention, as may be desired.

The operation of the oil burner motor **4** is facilitated through its connection to the power line **2** by means of connections **6** and **8**.

Lines **10** and **12** extend from the lines **6** and **8** respectively and lead to a wall receptacle **14** of the usual type.

The system hereof about to be described may be rendered operative merely by plugging into a wall receptacle such as **14** so as to obviate the expensive and laborious task of wiring into an already existing wiring system or installing an entirely now wiring system.

As will subsequently be observed, the system is foolproof in that the commodity consuming mechanism, such as the oil burner, cannot be operated independent of the invention thereof to thereby thwart the efforts of the vendor of the commodity from insuring payment for his said commodity.

The primary of a step-down transformer, generally indicated by **16**, is connected to the lines **6** and **8** by means of connections **18** and **19** respectively.

The transformer, when energized, provides a low voltage of 25 volts to the system.

The secondary of the transformer **16** is connected by a connection **20** to a low voltage relay **22**.

The arm **24** of the relay **22** is in the high voltage line **8**.

The relay **22** is connected by a connection **26** to the arm **28** of a relay **30**.

A connection **32** connects between the contact **34** of the relay **30** and the secondary of the transformer **16**.

A conventional double prong plug represented by **40** is connected to the relay **30** by means of a connection **42** along which a normally open switch **44** is placed. Said switch **44** closes upon the dropping of an appropriate coin into the coin receiving mechanism generally represented as within the dash lines C.

The switch **44** controls the operation of a timer motor **46** connected by a connection **48** to a contact **49** of the switch **44** to the connection **42** and also connected by a connection **50**, to a connection **52** connecting between the relay **30** and the contact **54** of a relay **56**.

The arm **58** of the relay **56** is connected by a connection **60** to the other side of the plug **40**.

The primary of a transformer, generally indicated by **62** is connected to the lines **42** and **58** leading from the plug **40** by means of connections **64** and **66** respectively and is adapted, when energized, to provide a low voltage to a thermostat **68** by means of a connection **70** which is connected to the secondary of the transformer and a connection **72** which is connected between the contact of the thermostat and the relay **56**, said relay **56** being also connected by a connection **74** to the secondary of the transformer **62**.

The arms **24**, **28** and **58** of the relays **22**, **30** and **56** respectively are normally in circuit open positions when said relays are deenergized.

As aforesaid, a coin-controlled electrically-operated time measuring mechanism or device which may be of any well known and conventional type is generally designated as the aggroupment of components disposed within the dash lines indicated by the letter C.

Said components are preferably incorporated within the time measuring device so that, when and as same is brought by the vendor to the vendee's building for installation, he merely brings a compact unit easily secured against tampering by means of lock and key or equivalent means.

All that need be done by the vendor is to connect his unit to the low voltage lines **26** and **32** of the oil burner system of the building as will subsequently be observed. Connections **70** and **72** must also be connected to transformer **62** and relay **56** respectively.

The clock mechanism or timing device will be such that, for a certain value of coin or coins, the clock mechanism or timing device, when energized, will operate for a certain predetermined period of time of operation of the oil burner.

That is, when a coin or coins is/are deposited thereinto, the clock mechanism will operate through a predetermined elapsed time period related to the value of the particular coin or coins deposited and will maintain the circuit in a closed condition so as to allow the functioning of the oil burner.

Upon termination of said elapsed time period and in the absence of the deposit of additional coinage, the system is rendered unoperative and the oil burner will not function.

Let us assume that the system has been properly wired into the low voltage lines **26** and **32** of the normal oil burner circuit and that the plug **40** has been inserted into the wall receptacle **14**.

With a coin deposited into the measuring device C, the switch **44** is caused to close against the contact **49**.

So long as the thermostat **68** is not calling for heat, no action ensues.

But when the thermostat does signal for oil burner operation, the relay **56** is energized so that the arm **58** thereof closes on the contact **59** and the relay **30** in turn

is energized so that the arm **28** closes on the contact **34**, wherefor the relay **22** in turn is energized by the closing of the arm **24** on the contact **25** in the line **8** and the oil burner is rendered operative by the flow of energy to the motor **4**.

Such condition prevails during the time interval determined by the value of the coinage deposited, which time interval is controlled by the motor **46**.

For the vendee to pull the plug **40** from its receptacle **14** and thus defeat or cheat the system will hardly suffice in view of the connections between the time measuring mechanism C and the low voltage circuit.

To defeat or cheat the system involves making an appropriate connection between the lines **26** and **32**.

When the timing motor has operated for the period of time related to the coil deposited, switch **44** opens and relay **30** is energized and the oil burner motor will not be operable on demand of the thermostat until the deposit of an additional coin or coins for another time cycle.

From the foregoing, the construction and operation of the system will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described.

Accordingly, limitation of this invention should be made only as determined by a proper interpretation of the terms used in the subjoined claim.

What it is desired to claim and secure by Letters Patent of the United States is:

I claim:

In combination with a power source and the motor of a thermostat-controlled oil burner and electrical connections therebetween, a switch means for connecting and disconnecting the motor and the power source and the thermostat including circuitry connecting to the switch means for effecting the connection of the motor and the power source upon a demand for operation of the motor and the disconnection thereof upon a satisfaction of the demand, the improvement in a prepayment mechanism for the control of the supply of energy to the oil burner

comprising, a high voltage power circuit connectable to the power source and including a time-measuring mechanism and a normally-open circuit-closing coin operated switch and a normally-open high voltage relay consisting of a relay coil and a normally-open circuit-closing signal switch arm, the coin-operated switch being movable into operative relation for the initiation of operation of the time-measuring mechanism responsive to the deposition of a prepayment coin of certain value past the coin-operating switch and into the time-measuring mechanism, the time-measuring mechanism including means for effecting the operation thereof through a total increment of continuous or non-continuous running time according to the value of the deposited coin, and a low voltage power circuit including a transformer having a primary connected to said high voltage power circuit and a relay consisting of a relay coil and a switch arm, the switch arm of the relay of said low voltage power circuit being disposed in said high voltage power circuit, said low voltage power circuit being connected to the thermostat and connections of a circuit between the signal switch arm of the relay of said high voltage power circuit and a contact therefor and the switch means between the power source and the motor of the oil burner, said low voltage power circuit being energized so long as the time measuring mechanism of said high voltage power circuit is rendered operative and the thermostat is demanding operation of the motor for effecting the actuation of the signal switch arm of the relay of said high voltage power circuit and the actuation of the switch means in the high voltage connections between the power source and the motor leading to the energization of the motor during any time interval while the thermostat is demanding motor operation falling within the time interval of prepaid running time of the time-measuring mechanism.

References Cited in the file of this patent

UNITED STATES PATENTS

2,139,523 Smith ---------- Dec. 6, 1938