United States Patent [19]

Gilboy et al.

[11] **3,748,444**

[45] **July 24, 1973**

[54] **ELECTRICAL IMPULSE COUNTER FOR AUTOMATIC CAR WASH AND THE LIKE**

[75] Inventors: **Joseph J. Gilboy; Robert C. Deane; Paul R. Kirtley,** all of Richmond; **William C. Jenkins,** Sandston, all of Va.

[73] Assignee: **Joseph J. Gilboy,** Richmond, Va.

[22] Filed: **Jan. 17, 1972**

[21] Appl. No.: **218,285**

[52] **U.S. Cl.**..... **235/92 CT,** 235/92 R, 235/92 EL, 235/92 PD, 235/92 FP

[51] **Int. Cl.** **G06m 3/12**

[58] **Field of Search**..... 235/92 FP, 92 PD, 235/92 C, 92 J, 92 CT

[56] **References Cited**

UNITED STATES PATENTS

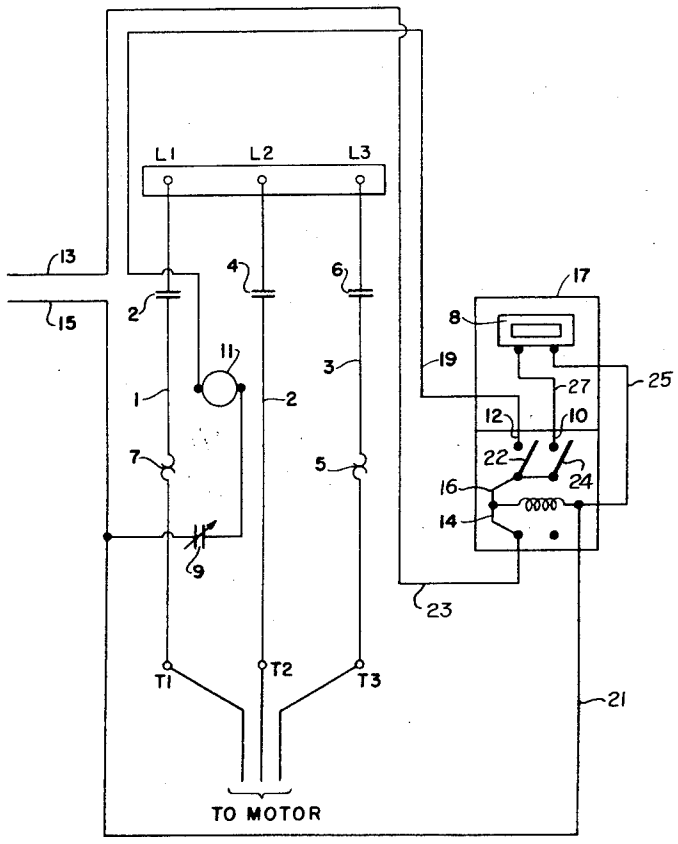
3,619,576	11/1971	Cauthen	235/92 FP
3,044,699	7/1962	Smith	235/92 PD
3,329,806	7/1967	McCauley	235/92 PD
2,906,298	9/1959	Burgiss	235/92 FP
3,436,530	4/1969	Faude	235/92 CT

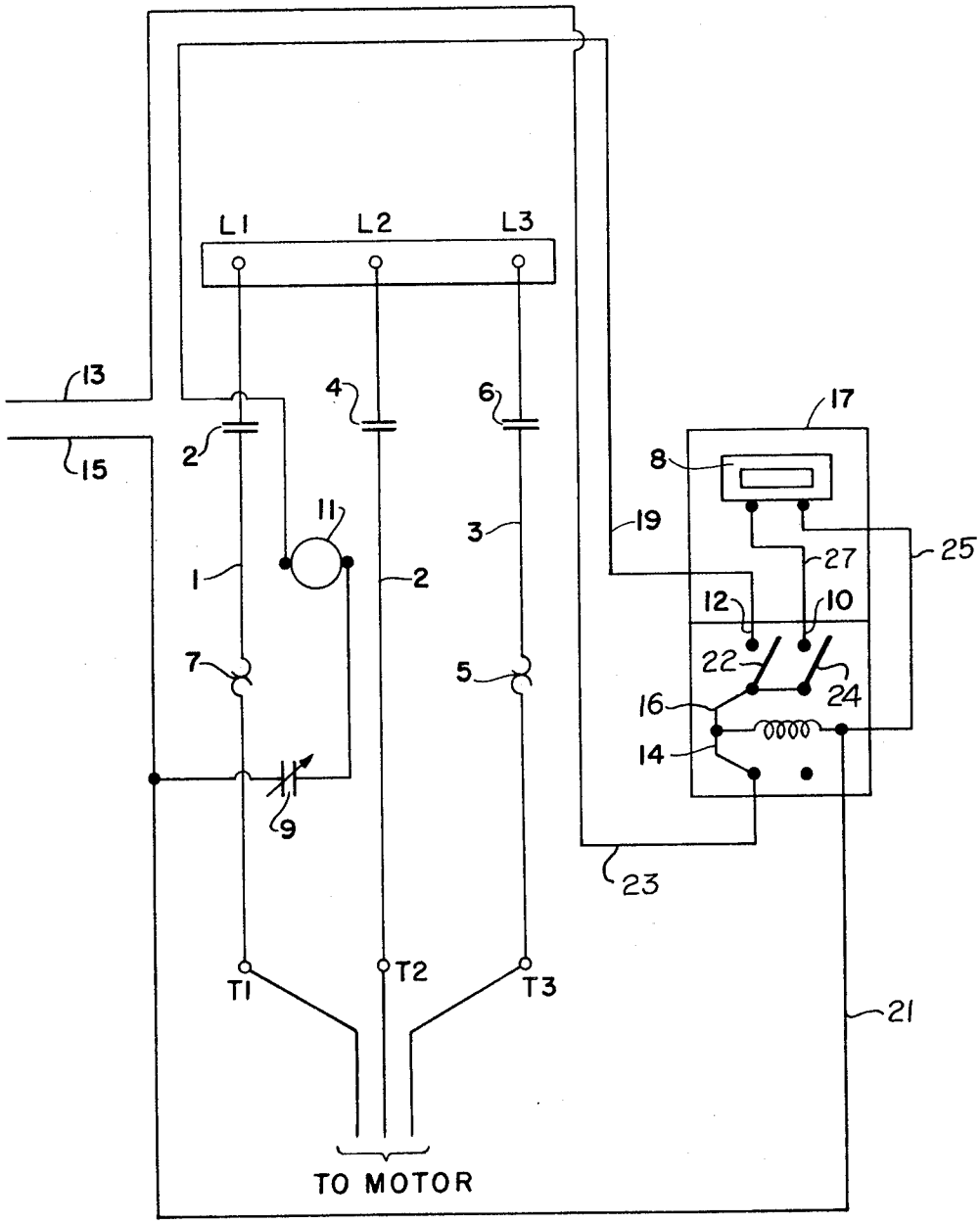
Primary Examiner—Maynard R. Wilbur
Assistant Examiner—Robert F. Gnuse
Attorney—Anthony T. Lane et al.

[57] **ABSTRACT**

A counter system that insures a count each time power is applied to an electric motor or the like is disclosed. The system is particularly adaptable to automatic car wash apparatus but can also be incorporated into electrically controlled vending machines or the like. Electrical power cannot be applied to a motor or other electrically operative device until the electrical impulse counter has been energized. Thus, the process to be counted cannot begin until a count has been initiated. The counter and associated apparatus are housed in a tamper-proof box using armor type cable or the like.

7 Claims, 1 Drawing Figure




L1
L2
L3
13
15
2
4
6
11
1
2
3
7
5
9
T1
T2
T3
TO MOTOR
17
8
19
27
25
12
10
22
24
16
14
23
21

ELECTRICAL IMPULSE COUNTER FOR AUTOMATIC CAR WASH AND THE LIKE

BACKGROUND OF THE INVENTION

This invention relates to counters and more particularly to electrical impulse counters for counting the number of times electrical apparatus, such as a water pump motor of an automatic car wash, has been turned on.

In vending machines, automatic car washes or the like, the income derived by the owner thereof is directly related to the number of times the device in question is utilized. The owners of this type of apparatus are often not the proprietor or manager of the establishments where the apparatus is located. Therefore, there is always a danger that the owner may not be receiving full compensation for the use of his equipment.

Apparatus of this type does, of course, presently have various safeguards built in to protect the owner. However, experience has shown, particularly in automatic car washes, that present safeguards can be and are readily defeated. Thus, the apparatus is utilized and the owners are not paid for this use. This invention insures a count each time the apparatus is utilized.

SUMMARY OF THE INVENTION

An electrical impulse counter system particularly adaptable to automatic car wash apparatus is disclosed. Each time an automobile enters the car wash, a count is registered on the counter. The system is so designed that the pump motor for the wash water or other motor of the car wash system cannot be energized until the counter is energized. Power is not applied to the motor until the counter is energized. Thus, the car wash cannot be used until the counter itself is energized to register a count.

The counter and the components directly associated with the energization of the motor and counter are housed in a tamper-proof box and power is brought to the box by means of an armored cable or the like. One must break open the box or cut through the cable to defeat the counter system of this invention. Of course, such destruction is immediately apparent to the owner of the car wash.

While the invention is specifically described as being applied to an automated car wash, it can also be applied to any apparatus where electrical power must be applied to a motor or other device to operate the apparatus; for example, electrically operated vending machines. This will, of course, be apparent to those skilled in the art.

BRIEF DESCRIPTION OF THE DRAWING

A clear and concise understanding of the structure and operation of the invention can be obtained from the following detailed description of the invention when read in conjunction with the annexed drawing in which the single FIGURE shows a preferred embodiment of the invention.

DESCRIPTION OF THE INVENTION

The single FIGURE of the drawing shows a preferred embodiment of the invention as it is utilized in an automatic car wash system. An automatic car wash system is one in which an automobile passes through the system and is washed and dried mechanically. That is, no human labor is necessary to perform the operation of

washing the car. Many of these systems are coin operated. If one wishes to clean his automobile in such a coin operated system, he merely drives the car into the car wash, inserts the proper amount of money, and the system automatically processes the car through the various steps of the system. At the end of the system there is generally a lever or wand that is tripped to shut down the car wash apparatus. While the embodiment of the invention as shown is described as being applied to an automatic car wash, it will be appreciated by those skilled in the art that the apparatus of such a car wash system is similar to the apparatus of a non-automatic conventional car wash. Thus, the invention as shown could be applied directly to these other car wash systems.

Referring to the drawing, the electrical conductor **1** is connected between the terminals L_1 and T_1 through a contact **2** and a fuse **7** and the electrical conductor **2** is connected between the terminals L_2 and T_2 through the contact **4.** Similarly, the electrical conductor **3** is connected between the terminals L_3 and T_3 through the contact **6** and the fuse **5.** Terminals L_1, L_2 and L_3 are connected to a source of three phase power (not shown). The power applied to terminals L_1, L_2 and L_3 is generally 240 volts, three phase. A three phase AC motor (not shown) is connected to terminals T_1, T_2 and T_3. For purpose of this description, the motor connected to terminals T_1, T_2 and T_3 is assumed to be the car wash water pump motor. This motor is conventionally a three phase motor and the operation of this motor is an essential step in wash operation. As will be apparent later, this invention can be used in cooperation with other motors of the car wash system.

The conductors, terminals, contacts and fuses mentioned above are all conventional elements of the starter circuitry of a car wash pump motor. As shown in the FIGURE, this starter circuitry also includes a motor starter coil **11** and the contact **9.** In the conventional automatic car was system one side of starter coil **11** is connected directly to the conductor **13** and the other side is connected to the conductor **15** through capacitor **9** as shown. Conductors **13** and **15** are connected to the control circuits (not shown) of the car wash system. In a coin operated system, insertion of the proper amount of coinage closes a switch. Closing of this switch places 120 volts, single phase, on lines **13** and **15,** thereby closing contact **9,** energizing starter coil **11** and thus closing contacts **2, 4** and **6** to start the motor. Contact **9** is actually a voltage responsive switch.

The apparatus and operation just described are that of a conventional automatic car wash system. As shown in the FIGURE, one side of starter coil **11** is not directly connected to conductor **13** as is the case in a conventional system, but is rather coupled to conductor **13** through the apparatus of this invention. Basically, the apparatus of the invention comprises an impulse counter **8** and a relay **16** having a coil **14,** the switch arm **22** and **24** and contacts **10** and **12.** One side of motor starter coil **11** is connected to contact **12** of relay **16.** The other side of motor starter coil **11** is connected through contact **9** to conductor **21,** which in turn is connected to conductor **15.** Thus, starter coil **11** is essentially connected directly to conductor **15** through contact **9.** As was mentioned above, this side of starter coil **11** is conventionally connected to conductor **15** through capacitor **9.** Conductor **21** is also

connected to one side of relay coil 14. This same side of relay coil 14 is also connected to one side of counter 8 by means of the conductor 25. The other side of counter 8 is connected to contact 10 of relay 16 by means of the conductor 27 and the other side of relay coil 14 is connected to conductor 13 by means of the conductor 23.

Relay 16 and counter 8 are shown as being mounted inside an electrical box 17. Electrical box 17 is a heavy duty conventional type steel utility box. The box has a cover (not shown) which is closed and sealed or locked. The cover may have a small glass window that permits one to read counter 8 without unlocking or unsealing the box. Conductors 19, 21 and 23 are the conductors of an armored cable or the like and the cable is brought into box 17 in such a manner that the cable and conductors cannot readily be tampered with or removed from box 17. Conductor 25 which is shown as being partially outside of box 17 is actually totally inside the box. Thus, counter 8, relay 16 and the conductors connected to these devices are essentially tamperproof. One cannot readily gain access to box 17 and thereby bypass counter 8. Of course, one could cut the conductors or break open box 17, but such damage would be readily apparent.

Now that the apparatus of the invention has been described, the operation will be described. Assume that one wishing to use the system has deposited the proper amount of money; then power will be applied to conductors 13 and 15. Energizing conductors 13 and 15 energizes relay coil 14. When relay coil 14 is energized, arms 22 and 24 of relay 16 close on contacts 12 and 10, respectively and contact 9 closes. When relay arms 22 and 24 close on contacts 12 and 10, power is applied to counter 8 and to starter coil 11 since contact 9 is also closed. When starter coil 11 is energized, contacts 2, 4 and 6 are closed, thereby applying a voltage to terminals T_1, T_2 and T_3 to run the motor. Counter 8 is an electrical impuse counter. When the power is applied to the counter, a count is initiated. However, since this is an impulse counter, the count is not completed until the power is again removed from the counter.

With the pump motor running, the automobile can now proceed through the car wash. As was mentioned, automatic car washes are generally equipped with a lever or wand switch that is actuated by the automobile as is passes over the lever or wand. This switch is connected in either conductor 15 or 13 and open circuits the conductor in which it is connected when actuated by the automobile. Thus, when the automobile passes over the lever or wand switch, relay coil 14 is de-energized and relay arms 22 and 24 move off of contacts 12 and 10, thereby disconnecting conductor 19 which is connected to starter coil 11 and conductor 27 which is connected to counter 8 from line 23. Thus, de-energizing relay 14 also de-energizes starter coil 11 and removes power from counter 8. De-energizing starter coil 11 opens contacts 2, 4 and 6 to shut down the pump motor and removing the voltage from counter 8 completes a one count on the counter. As was mentioned above, counter 8 is an inpulse counter and the count is not complete until the power is removed from the counter.

From the foregoing description it is quite obvious that a count will be registered each time the car wash is operated. In the embodiment shown, the pump motor and counter are energized. simultaneously. Relay 16 must bc energized before any power can be applied to the motor and energizing this relay also applies power to the counter. Furthermore, the relay and counter are sealed to prevent one from bypassing the counter system. It should also be obvious that the relay and counter arrangement could be utilized with other motors of the car wash apparatus and could also be used in other systems, such as vending machines. For example, relay 14 and counter 8 could be used with an electric cigarette machine such that the motor which turns the apparatus to drop a pack of cigarettes is controlled by the relay-counter combination. In addition, it will be obvious to those skilled in the art that various changes and modifications can be made to the embodiment shown and described without departing from the spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. In combination with a car wash system, a counter system comprising: a counter, a relay having first and second contacts, a relay coil and a pair of electrically connected relay arms; means to connect said first relay contact to said counter; means to connect said second relay contact to the starter coil of a motor of said car wash system, means to connect one side of said relay coil to said pair of electrically connected relay arms; means to connect the other side of said relay coil to said counter in such a manner that said counter is connected between said other side of said relay coil and said first contact; and means to connect said relay coil to said car wash system in such a manner that said relay coil is energized when said car wash system is activated, whereby said counter and said car wash motor are energized when said relay coil is energized.

2. The combination as defined in claim 1 wherein one of said pair of relay arms closes on said first relay contact and the other of said pair of relay arms closes on said second relay contact when said relay coil is energized.

3. The combination as defined in claim 2 wherein said relay and said counter are housed in a tamper-resistant, locked, steel utility box and all electrical conductors brought into said box are covered by a protective sheath.

4. The combination as defined in claim 3 wherein said motor starter coil is the starter coil of the water pump motor of said car wash system.

5. In combination with vending apparatus, a counter system comprising: a counter, a relay having first and second contacts, a relay coil and a pair of electrically connected relay arms; means to connect said first relay contact to said counter; means to connect said second relay contact to an electrically responsive operator of said vending apparatus, means to connect one side of said relay coil to said pair of electrically connected relay arms; means to connect the other side of said relay coil to said counter in such a manner that said counter is connected between said other side of said relay coil and said first contact; and means to connect said relay coil to said vending apparatus in such a manner that said relay coil is energized when said vending apparatus is activated, whereby said counter and said electrically responsive operator of said vending apparatus are energized when said relay coil is energized.

6. The combination as defined in claim 5 wherein one of said pair of relay arms closes on said first relay contact and the other of said pair of relay arms closes on

said second relay contact when said relay coil is energized.

7. The combination as defined in claim 5 wherein said relay and said counter are housed in a tamper-resistant, locked, steel utility box and all electrical conductors brought into said box are covered by a protective sheath.

* * * * *