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CURRENT ACTUATED SWITCH FOR CASH REGISTER

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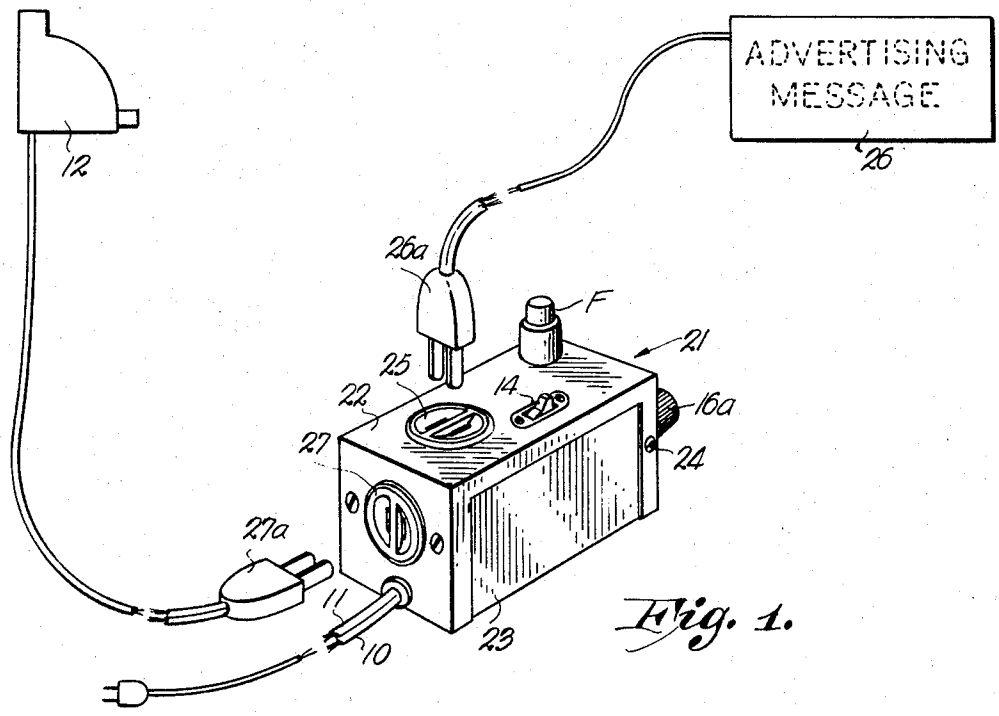


Fig. 1.

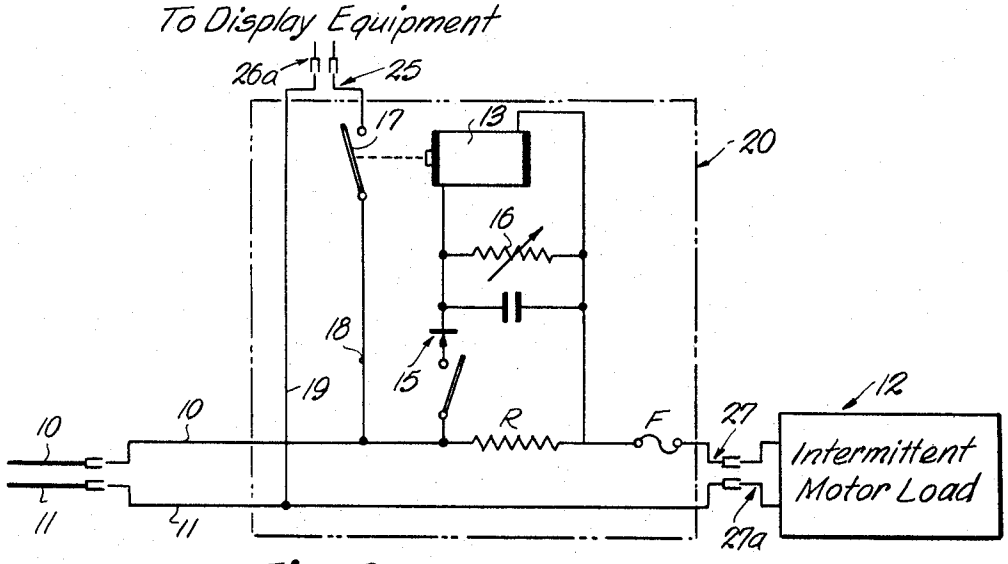


Fig. 2.

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CURRENT ACTUATED SWITCH FOR CASH REGISTER

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ABSTRACT OF THE DISCLOSURE

This application relates to the operation of a display device connected to a cash register. The display device is connected to a supply source through relay contacts. The relay is operated in response to current being supplied to the motor of the cash register.

This invention relates to the control of illuminated advertising signs and/or alarms, and refers more particularly to current operated switching units for use with such signs or alarms in conjunction with electric cash registers.

There has long been a demand on the part of sellers of goods to retail stores, bars, and restaurants for some effective means by which an illuminated or audible display device could be connected with and flashed on by each operation of the conventional electric cash register. In addition, the owners or operators of such establishments have, on many occasions, expressed need for a simple device which could service and operate a remotely located visual or audible device in response to operation of the cash register. Various types of display signs and/or alarms have been suggested; however, all known designs, which include flashing lights, buzzers, horns, bells and pop-up signs, etc., call for mechanical or electrical linkages integral with the cash registers themselves. For example, some systems include a special operating key, as a part of a conventional cash register keyboard, for either energizing or deenergizing an electrical circuit prior to opening the cash register drawer. Other arrangements employ pressure sensitive switches or pre-conditioned switches which are either opened or closed according to the relative physical position of the drawer of the cash register. In every instance, some modification or pre-arrangement of electrical or mechanical components, integrally associated with the cash register, must be made before the device can be utilized.

A principal object of this invention is to provide an unique means for external connection with an electric cash register and capable of automatically displaying an advertising sign, plurality of signs, or to sound an alarm, at a predetermined point in the operational routine of the cash register.

Another object of the invention is to provide a rugged, inexpensive, compact, current-actuated switching unit whose operation is automatically initiated from the current drawn by an electric cash register motor. It is an important feature of the invention that the switching unit shall be utilized for energizing display or alarm equipment and that said unit requires absolutely no modification of either the electrical or mechanical components of the existing cash register in order that it may be optimally utilized therewith.

Another object of the invention is to provide an improved means, having a minimum of moving parts, for initiating the remote energization of display equipment in accordance with the "on" condition of an electric cash register motor and for maintaining the energized state of said display equipment for a pre-set and variable time period after said motor is "off". Accordingly, the displayed equipment may be regularly energized over a prolonged period of time and will require a minimal amount of adjustment, supervision and replacement parts.

A still further object of my invention is to provide a switching unit, of the character described, which includes a means for connecting electrically operated display equipment to a conventional power supply and maintaining the connection for a selected time interval, thereby eliminating any need for independent power sources or equipment.

Other and further objects of the invention, together with the features of novelty appurtenant thereto, will appear in the course of the following description.

In the accompanying drawing, which forms a part of the specification and is to be read in conjunction therewith, and in which like reference numerals indicate like parts in the various views;

FIG. 1 is a perspective view illustrating the switch unit as housed and showing the associated equipment utilized therewith; and

FIG. 2 is an electrical schematic diagram of a typical unit embodying the invention.

Referring now to the drawing, the electrical circuitry and general manner of operation of the unit incorporating the features of the invention will be described in connection with the schematic diagram constituting FIG. 2. In this figure, reference numerals **10** and **11** represent a pair of conductors which we will assume are plugged into or otherwise connected to a conventional 115 volt, 60-cycle AC basic supply source. Conductor **10** is connected from the supply source through resistance R, fuse F, to one side of an intermittent motor load, generally represented by the numeral **12**. It is contemplated that this intermittent motor load be the type that is generally associated with an electrically operated cash register. In other words, load **12** will not be across conductors **10** and **11** until the operator of the cash register activates the appropriate switch or key making the momentary across-the-line connection. The usual "on" time for the conventional cash register electric motor is approximately one second. The opposite side of intermittent motor load **12** is connected by conductor **11** and back to the basic supply source. When load **12** is not assuming the across-the-line characteristic, conductors **10** and **11** are open circuited unless a subsequent load has been appropriately applied thereto.

A direct current operated sensitive type relay **13** is connected across resistance R through a conventional toggle switch **14** and rectifier **15**. Relay **13** is shunted by the parallel resistance-capacitance combination shown by the variable resistor **16** and capacitor C. Normally open relay contact **17** is closed by the energization of relay **13**.

The conductors **18** and **19** are connected across the basic supply source conductors **10** and **11**, respectively. These conductors, **18** and **19**, connect the power source to the display equipment when normally open contact **17** in conductor **18** is in the closed position due to the energization of relay **13**.

The portion of FIG. 2 shown within broken line **20**, and hereinafter referred to as the switching unit, is housed within the casing generally shown at numeral **21** in FIG. 1. The main body of housing **21** comprises a shell **22**, preferably of drawn aluminum, having five enclosed sides. Plate **23** forms the sixth side and is removably affixed to shell **22** by a conventional screw **24** in order to give access to the switching unit mounted therein. The on–off toggle switch **14** extends through the top of shell **22** and provides a means for either connecting or disconnecting current operated relay **13** located within. The fuse F is likewise located on the top exterior of shell **22**. A knurled knob **16***a* extends from one end portion of shell **22** and provides a means for setting the resistance of variable resistance **16**. A conventional socket **25** is snugly fitted into an aperture in the top of shell **22** allowing the display equipment, diagrammatically represented by the electrically illuminated sign **26** and a typical two-pronged

plug **26***a*, to be connected thereto by inserting the plug in the socket. This plug-in attachment results in sign **26** being connected, by conductors **18** and **19**, through normally open contact **17** to the power source represented by conductors **10** and **11**. It should be understood that sign **26** could take on many other forms, either visual or audible, and the only requirement is that it be electrically operated.

Socket **27** is similarly affixed in shell **22** so that its receptacle portions extend outwardly of the end opposite knurled knob **16***a*. Socket or outlet **27** provides the means for connecting the cash register cord **27***a* thereto and thusly the intermittent load **12** to the primary source represented by conductors **10** and **11**. As seen in FIG. 2, this plug-in attachment, diagrammatically made between fuse F and load **12**, connects the intermittent motor load through the switching unit **20** to the source.

In readying the sign for operation, the power line **10**, **11** is plugged into an appropriate convenience outlet (not shown) or other available source of power, the cash register cord is plugged into socket **27** and the sign cord into socket **25**. Toggle switch **14** is shifted to the ON position, if not already there. Since the relay contact **17** is normally open, and since the cash register is normally quiescent, no current ordinarily will flow into the line to the display equipment.

Any time thereafter that the cash register is operated, motor load **12** is applied to lines **10**, **11** and current flows therethrough, although for only a very short period, normally in the nature of a second. With motor load **12** across lines **10** and **11**, current is flowing from line **10** through the load to line **11**. The current flow in line **10** through resistance R develops a voltage across resistance R. This voltage is rectified by rectifier **15** and results in sufficient DC current flow through the current operated relay **13** that normally open contact **17** is now pulled in or closed. The closing of contact **17** immediately energizes the display equipment.

As mentioned above, load **12** is only momentarily connected across lines **10** and **11** and therefore it is desirable to provide some means for holding contact **17** closed in order to maintain the energized state of the display equipment for an interval longer than the one second "ON" time of load **12**. The discharge of capacitor C supplies current to relay **13** so that the display equipment may remain "ON" even though the motor load has subsequently been open-circuited. The rectified current flowing through diode **16** charges capacitor C to a potential equal to voltage developed across resistor R. When load **12** is no longer across the line, the voltage across resistor R drops, causing the capacitor to discharge and the current through relay **13** to decay at an exponential rate. The rate of decay is controlled by the variable resistance **16** so that the time interval between start of decay and the eventual opening of contact **17** may be increased or decreased depending upon the resistive value set in the variable resistor.

After the pre-set time interval has lapsed, contact **17** returns to its normally open position and the display equipment is accordingly disconnected. This procedure is repeated as often as dictated by the condition of load **12**. Modifications are possible, such as having parallel connected display devices and/or switching units with the time intervals staggered to allow sequential deenergization of a plurality of display devices.

While the invention has been explained in conjunction with a display sign, it will be evident that an electrically energizable alarm or other appliance can be just as well connected with the switching unit in place of the sign. Moreover, either the sign or alarm can be stationed at a location quite remote from the cash register, making it possible to visually or audibly determine the fact of operation of the cash register from any desired vantage point, concealed or unconcealed.

From the foregoing, it will be seen that this invention is one well adapted to attain all of the ends and objects hereinbefore set forth together with other advantages which are obvious and which are inherent to the apparatus.

It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of the claims.

Inasmuch as various possible embodiments of the invention may be made without departing from the scope thereof, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. In combination in an electrically operated switching system,

a cash register having an electric motor of the type that is intermittently and momentarily connected across an electrical power source,

an electrically operated normally deenergized display circuit,

means including a current responsive means for connecting said circuit to said power source, said means being operated in response to said motor being connected across said power source,

said connecting means thereby causing the energization of said display circuit, and

means for maintaining the energization of said circuit for a pre-set period after said motor has been disconnected from said power source.

2. The invention in claim **1** wherein said connecting means includes a current actuated relay having a normally open contact in said circuit, said relay being connected between said source and said electrical motor through a rectifier, said rectifier operable to supply sufficient current to said relay upon the connection of said motor with said power source to close said normally open contacts thereby connecting said display circuit to said power source.

3. The invention in claim **2** wherein said relay is shunted by a capacitor and a variable resistor, said capacitor operable to be charged by the current flow from said rectifier upon said connection of said motor with said power source and to discharge through said relay when said motor is disconnected from said power source, said capacitor discharge thereby maintaining said normally open contacts closed for a pre-set time period, said variable resistor operable to control the rate of decay of said capacitor thereby causing said pre-set time period to be variable.

4. A current operated switching unit for use with electric cash register motors, said motors being of the type that are intermittently and momentarily switched from an OFF to an ON condition as a normal operating function of the electric cash register controlling said motor, said unit comprising

an electrical connector for connecting said unit with a source of electrical power,

an electrically operated normally deenergized display circuit,

means including a current responsive means for connecting said circuit to said power source said means being operated in response to said motor being switched to said momentary ON condition and thereby energizing said display circuit, and

means for maintaining the energization of said circuit for a pre-set period after said motor has been switched to the OFF condition.

5. The invention in claim **4** wherein said connecting means includes a current-actuated relay having a normally open contact in said circuit, said relay being connected between said source and said motor through a rectifier, said rectifier operable to supply sufficient rectified current to said relay upon switching said motor to the ON condition to close said normally open contacts, thereby connecting said display circuit to said power source.

6. The invention in claim 4 wherein said relay is shunted by a capacitor and a variable resistor, said capacitor operable to be charged by the current flow from said rectifier upon said switching of said motor to the ON condition and to discharge through said relay when said motor is switched to the OFF condition, said capacitor discharge thereby maintaining said normally open contacts closed for a pre-set time period, said variable resistor operable to control the rate of decay of said capacitor thereby causing said pre-set time period to be variable.

7. The invention in claim 4 wherein said unit is mounted within a unitary housiag, said housing being structurally independent of said cash register.

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