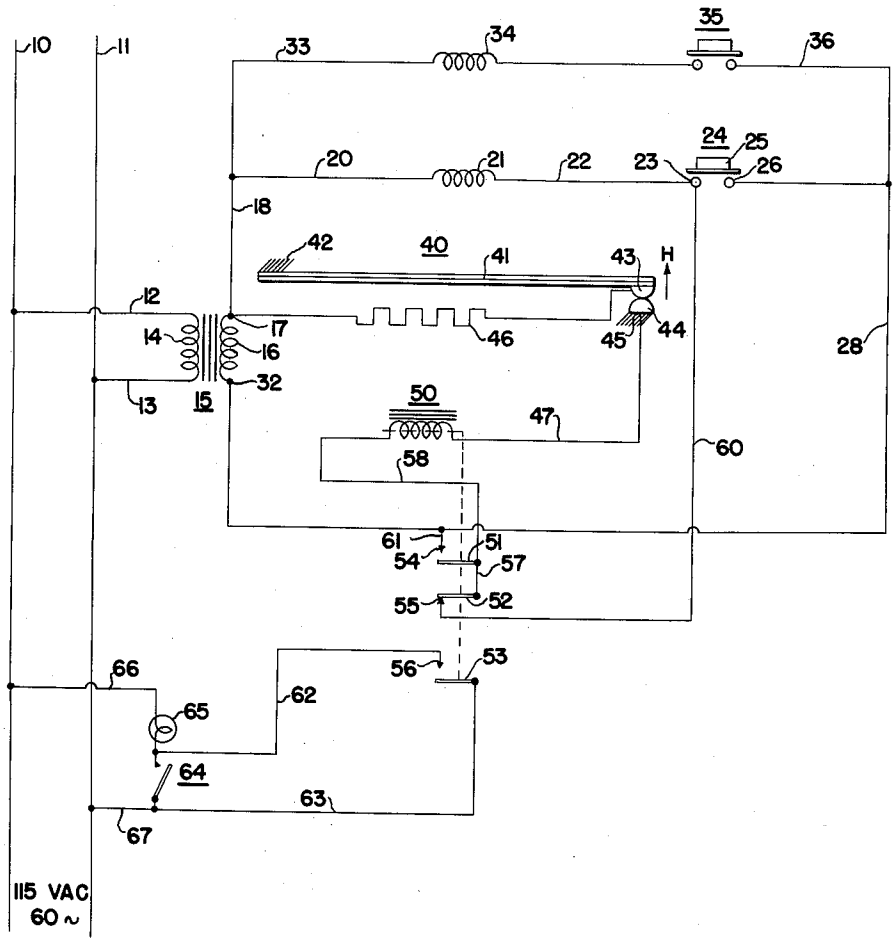
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DOORBELL AND PORCH LIGHT CONTROL

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DOORBELL AND PORCH LIGHT CONTROL

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The novel circuitry disclosed relates to an improved arrangement of a porch light and doorbell for household use.

In most residences there are provided two independent circuits for the front porch light and the doorbell. After dark, the usual procedure upon noting the ringing of the doorbell is for the occupant of the house to switch his front porch light on to determine the identity of his guest. Many times the occupant of the house, after admitting the guest, forgets to switch off the front porch light and the light is allowed to burn uselessly for long periods of time. This same carelessness may extend even to the extent of neglecting to turn the light on at the time of opening the door and results in an impolite or even sometimes dangerous act. The novel circuitry proposed would overcome these defects as well as provide utility which could be utilized by the home owner under circumstances other than the admission of a guest to his home, as will be noted below.

The novel circuitry disclosed consists of an improved combination of a doorbell and porch light, wherein, upon energizing the doorbell switch the front porch light is automatically turned on. A relay utilizing interconnecting and interlocking contacts maintains the porch light in an energized state after the doorbell switch has been deenergized and the energization of the relay is then controlled by a bimetal switch. The bimetal switch provides a time delay and allows the light to be left on for a predetermined period after the deenergization of the doorbell switch. This arrangement provides for the polite and immediate illumination of the front porch upon energization of the doorbell and yields automatic protection against overlooking the fact that the porch light has been left on. With this arrangement the porch light is automatically turned off after the predetermined time delay and requires no further attention from the householder.

This circuitry not only can be used by the occupant of the house in connection with answering the doorbell, but allows him to utilize his own doorbell and porch light for safety and convenience. It will be noted that by energizing his own doorbell upon leaving his home, the householder has a light which will guide his way down his front stairs and walk, and which will be automatically extinguished by the bimetal operated switch. This same operation can be utilized upon arriving home in the dark, and thereby affords protection and necessary light to conveniently open the door.

It is an object of this invention to provide an improved circuit which operates two normally independent circuits simultaneously and retains one in operation for a fixed period, but allows the other to be deenergized at once.

It is a further object of this invention to provide an economical and improved circuit for operating a house porch light and doorbell from the doorbell switch, and which retains the energization of the light for a fixed time delay after the bell has been rung.

Still a further object of this invention is to provide an improved circuit which can be made economically for a house porch light and which adds safety and convenience without adding switches which would not normally be installed.

These and other objects will become apparent when the single circuit diagram disclosed is considered with the following description of its operation.

In the novel circuitry disclosed there are two power lines **10** and **11** and which would normally be energized by 115 volts A.C. at 60 cycles. Connected to lines **10** and **11** by leads **12** and **13** is the primary winding **14** of transformer **15**. The transformer **15** is of a stepdown type normally used in bell ringing and low voltage control circuits. The transformer **15** further has a secondary winding **16**. One extremity **17** of the secondary winding **16** is connected by leads **18** and **20** to an audible signal control winding **21**, which may be a doorbell, doorchime, or similar device. Winding **21** is then connected by lead **22** to one terminal **23** of a momentary push button switch generally shown at **24**. The switch **24** further contains a push button operating member **25** and a second terminal **26**. The terminal **26** is connected by a conductor **28** to a terminal **32** on the secondary winding **16** of transformer **15**. It will be noted that the combination of the transformer secondary winding **16**, operator **21**, and switch **24** constitute a conventional doorbell circuit.

An additional audible signal control means can be added to transformer secondary winding **16** without disturbing the previously described circuitry. As an example of this, a circuity consisting of conductors **18** and **33**, audible signal means **34**, push button **35**, and leads **36** and **28** by have been disclosed. It is obvious that upon operation of push button switch **35** that the audible signal means **34** is energized and that its operation is completely independent of the remainder of the circuitry. This added circuit could represent a back or side door signal and is illustrative only.

A bimetal operated switch is generally shown at **40** and includes a bimetal member **41** rigidly mounted at **42** and having a contact **43** at the end remote from its rigid mounting. The contact **43** cooperates with a second contact **44** which in turn is rigidly mounted at **45**. Connected between terminal **17** of the transformer secondary winding **16** and contact **43** is a heater **46** which is in a heat transferring relation with the bimetal **41**. The contact **44** is in turn connected by lead **47** to a relay generally shown at **50**. Relay **50** includes three simultaneously movable contacts **51**, **52** and **53** as well as three fixed contacts **54**, **55** and **56**. Movable contacts **51** and **52** are joined together electrically by lead **57** and then in turn by a lead **58** are connected to the relay **50**. Fixed contact **55** is connected to terminal **23** of switch **24** by lead **60** and fixed contact **54** is connected by lead **61** to lead **28**.

Contacts **53** and **56** form a control circuit through leads **62** and **63** across a switch generally disclosed at **64**. The switch **64** corresponds to the normal interior porch light switch and is connected in series with a light **65** across power leads **10** and **11** by means of conductors **66** and **67** in a manner well known in the art.

The operation of this circuit can best be understood by considering it initially as completely deenergized, as shown. By operating switch **64** it is obvious that light **65** can be manually controlled on or off. It is further noted that the operation of either switch **24** or **35** will operate its respective audible signal means **21** or **34**. With the novel arrangement disclosed, the light **65**, push button **24**, and a front porch door (not shown) would all be located in the same vicinity so that the light from **65** would be available to illuminate a person standing at the door. This would correspond with the main entrance to a conventional house.

The operation of push button **24**, in the improved circuitry disclosed, causes the operation of the audible signal

means 21 and also supplies power from terminal 32 of the secondary winding 16 through conductor 28, the push button member 25, lead 60, contacts 55 and 52, lead 58, relay 50, contacts 43 and 44, and heater 46 to energize the relay 50. It is understood that the contacts 52 and 55 remain closed upon the operation of relay 50 until contacts 51 and 54 have closed. With this overlapping contact arrangement the energization of the relay is maintained through contacts 51 and 54 after the circuit through contacts 52 and 55 have been broken. The operation of relay 50 in turn causes relay contacts 53 and 56 to close thereby shorting switch 64. The shorting of switch 64 operates the light 65 and the light is retained on even if the switch 24 is released. The audible signal means 21 is not disabled by the disclosed circuitry nor is it rung continuously. It remains completely under control of the doorbell button 24.

It has been noted that after relay 50 has been energized, that a holding circuit is made through its contacts 51 and 54 and through heater 46. The heat from heater 46 is transmitted to the bimetal 41 and causes the bimetal to warp in the upward direction, as noted by an arrow. As soon as the bimetal 41 has warped a sufficient distance to open contacts 43 and 44, the circuit to relay 50 is opened and the contacts are returned to the position shown in the disclosed circuit. The length of time which is taken for the bimetal 41 to warp sufficiently to open contacts 43 and 44 can either be set permanently or be made adjustable by means well known in the art.

With the circuit disclosed it is obvious that it would be possible to control any number of lights and audible signal means or doorbells in a household or other location. The audible signal means disclosed in this application could easily be a doorbell, doorchime, or other door signal means including lights or control circuits. Since the principles disclosed in this application could be applied to numerous devices and locations the applicant wishes to be restricted only in the scope of the appended claims, as the preferred embodiment disclosed would suggest many applications to those skilled in the art.

I claim as my invention:

1. A household electric circuit comprising: a source of power, circuit means including a porch light and first switch means connected to said source of power, an audible doorbell signal, low voltage coupling means, second circuit means including said low voltage coupling means, said doorbell signal and a momentary type low voltage switch connected to momentarily energize said doorbell signal and concurrently with operation of said momentary switch, a bimetal operated switch, relay means including said first switch means and a second switch means, third circuit means connecting said coupling means to said relay means through said second switch means and said momentary type low voltage switch and including a heater associated with said bimetal, said third circuit means providing an arrangement for simultaneous energization of said porch light and said signal upon operation of the low voltage switch and delayed termination of the porch light after cessation of operation of said signal.

2. In an electrical circuit of the class described: a source of power; fixed circuit means connected to said source of power and including illumination means; second circuit means connected to said source of power and including audible signal means, said signal means and said illumination means being initially energized simultaneously from said source of power; and third circuit means including a delay acting temperature responsive switch having a controllable heat source and a relay means initiating the energization of said illumination means and maintaining its energization after said signal means is deenergized; said temperature responsive switch deenergizing said relay means and said illumination means in response to the heat source after a fixed delay.

3. In a household electrical circuit of the class described: a source of potential including connection means; a lighting circuit including a series control switch energized by said connection means; a doorbell circuit including a momentary series switch energized by said connection means; a warp switch including resistance heating means adjacent thereto and having normally closed contacts in series circuit therewith; a relay in series circuit with said contacts and in turn including a plurality of contacts; circuit means including a first of said relay contacts energizing said relay and heater from said connection means upon operation of said momentary switch, and a second of said relay contacts shorting said series control switch; and further circuit means including a third of said relay contacts continuously maintaining the circuit means energized until said normally closed contacts open.

4. In a household electrical circuit of the class described: a source of electric potential including connection means; a lighting circuit energized from said connection means and including a control switch; a doorbell circuit energized from said conection means and including a momentary switch; a bimetal warp switch having a resistive heating element adjacent thereto and said switch having normally closed contacts; a relay including a plurality of contact means; series circuit means including the relay, the warp switch heating element, first normally closed relay contact means, and the momentary switch energized from said connection means upon closing said momentary switch; and additional circuit means including second of said relay contact means shorting said control switch to energize said lighting circuit and third of said relay contact means energizing said series circuit until said heater causes said normally closed switch to open.

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