

[54] **PRODUCT VENDING MACHINE ALARM**

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[51] Int. Cl. **G08b 13/08**

[58] Field of Search **340/274 C, 274 R, 275, 340/220, 63, 276; 222/39; 221/3**

[56] **References Cited**

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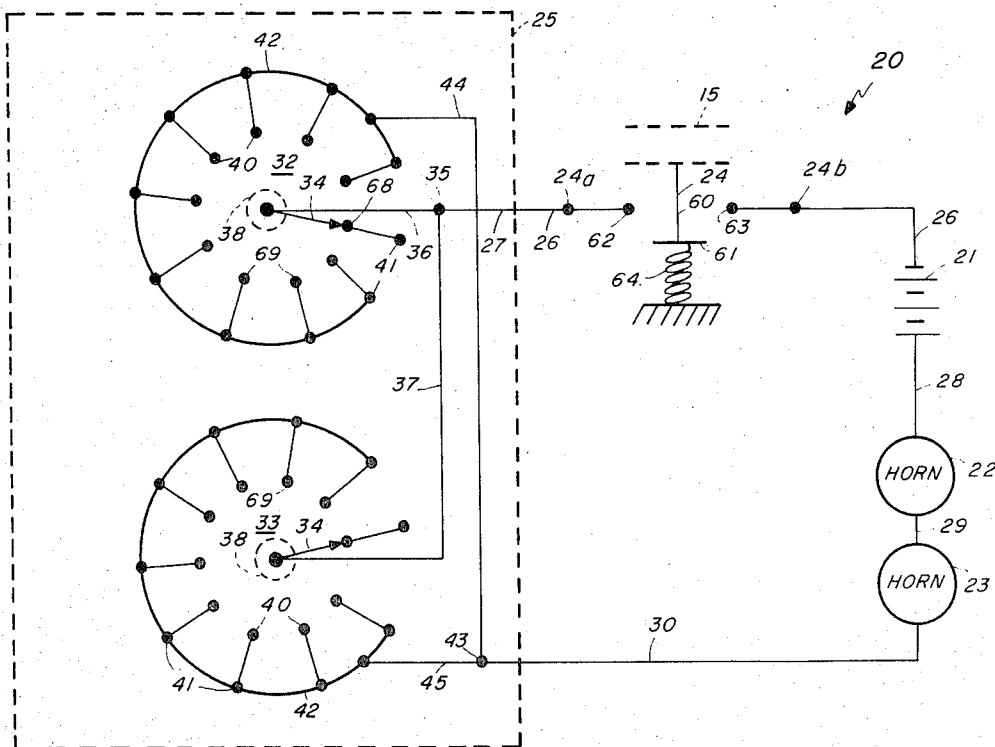
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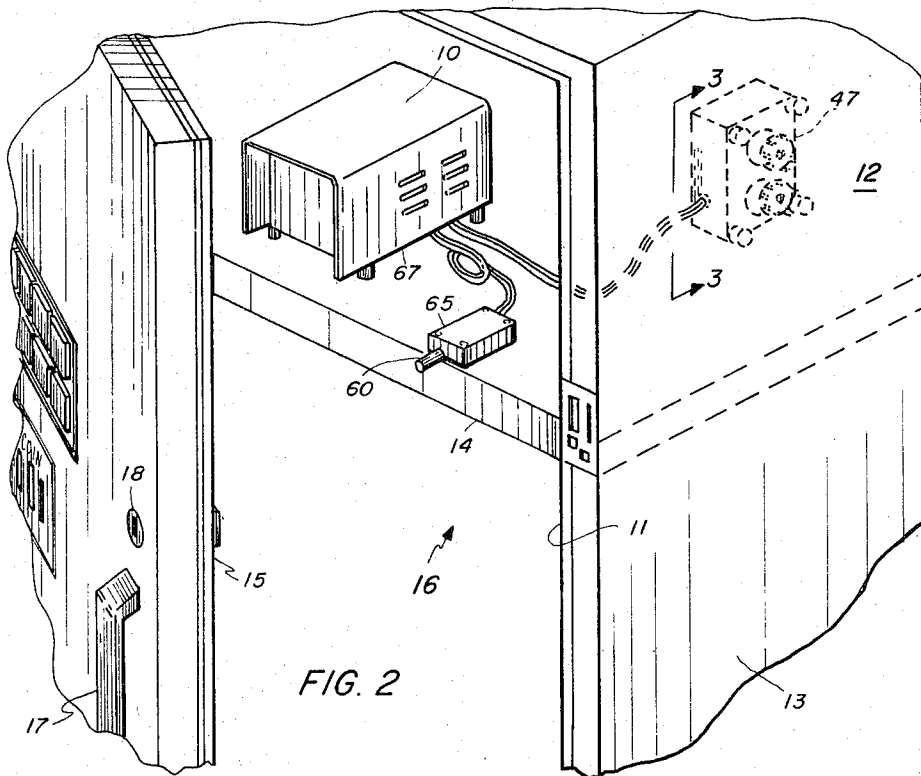
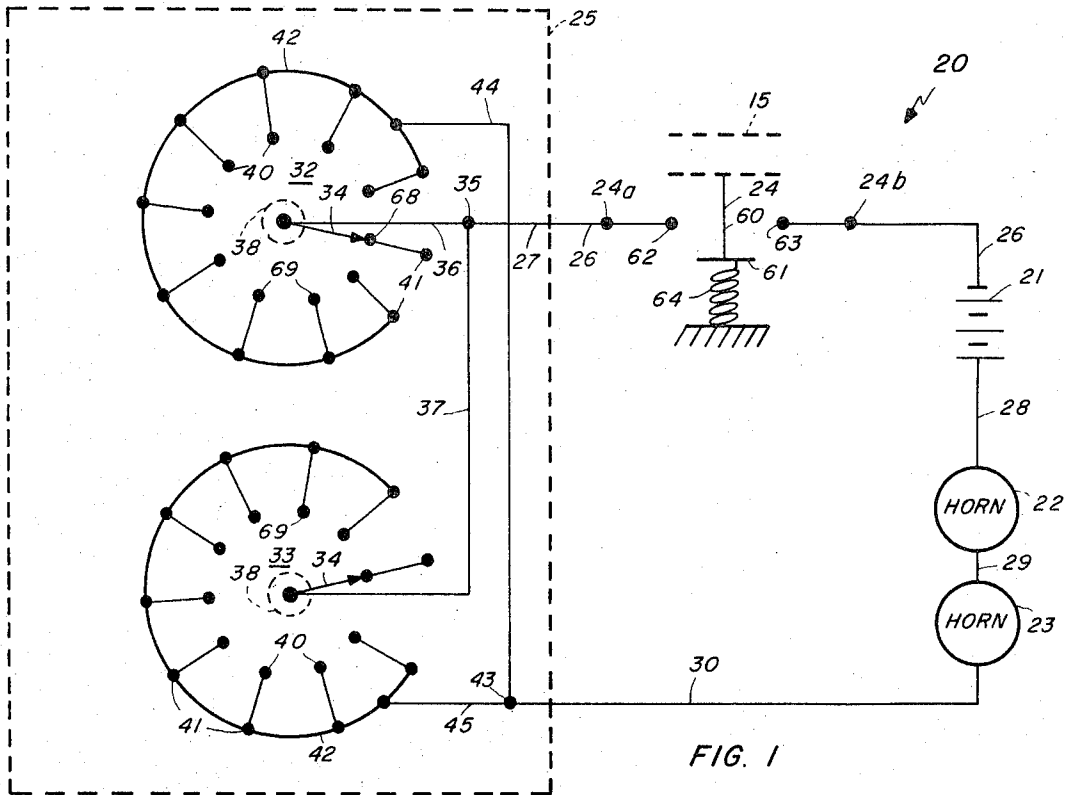
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[57] **ABSTRACT**

A vending machine is equipped with a self contained alarm device for signaling an unauthorized entry thereto. The device has a separately housed circuit arming and disarming mechanism that is mounted internally of the machine and manipulatable through a small opening in an exterior wall. The mechanism includes one or more circuit selector switches that are designed to make or break the alarm circuit in arming and disarming the alarm circuit. The circuit includes a battery and noise producing component such as a horn, that are also separately housed. This latter housing merely rests in the machine and can be moved about to random locations within the machine to avoid a pattern arrangement in equipping other machines with similar devices.

2 Claims, 5 Drawing Figures





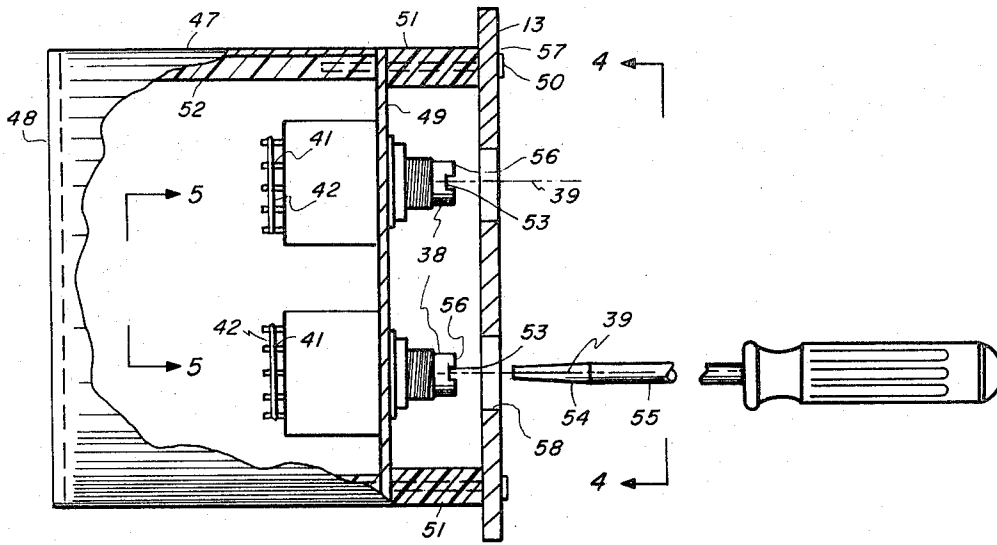


FIG. 3

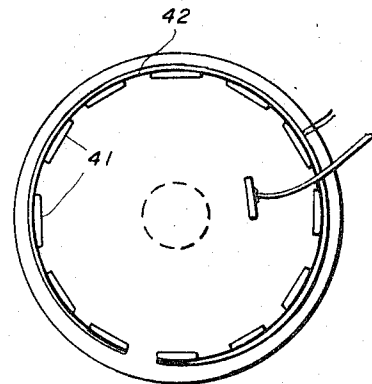


FIG. 5

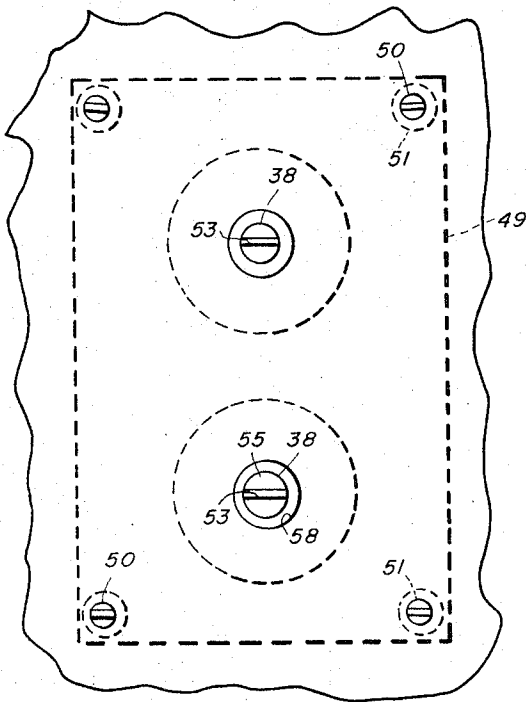


FIG. 4

PRODUCT VENDING MACHINE ALARM

BACKGROUND OF THE INVENTION

This invention relates to vending machines and more particularly to product vending machines that are equipped with signaling devices which are designed to produce an audible alarm when the machine is entered by an unauthorized person.

Machines that dispense soft drinks, cigarettes, and other products are common targets for vandals and thieves, and it has been proposed to equip such machines with suitable signaling devices that set off an appropriate alarm when the unauthorized break in is detected. Such devices will normally serve to deter the common vandal and petty thief.

There is an organized criminal element however that is not deterred by use of the conventional signaling devices in such machines. This element will invade a city or a local area and within a matter of two or three days, break into literally hundreds of vending machines and then vacate the area before local authorities can organize to combat such acts of thievery. This element is well versed in the locksmith arts and is well schooled in the composition and circuit formats for conventional signaling devices. Members of the element commonly operate in the guise of vending machine service and repair personnel and hence commonly go unnoticed when attempting to disarm or circumvent the operation of conventional alarm devices.

Conventional alarm circuits are commonly equipped with a key actuated device that is used by the authorized serviceman to disarm the alarm circuit before the vending machine is opened. Such devices fail to deter many of the professional thieves because of their vast knowledge of the locksmith arts. It has been proposed to use circuit selector switches as manipulatable means for arming and disarming the alarm circuits in lieu of the key actuated switching devices. Such selector switches can be used in various numbers and circuit combinations in an alarm circuit to provide a predetermined code or combination which must be known by the serviceman in order to disarm the signaling device and thereafter gain access to the machine without setting off the alarm. Moreover, the selector switches in each alarm circuit may be wired to establish a different code or combination for each machine that is equipped with this type of alarm circuit so that the knowledge of one code or combination is useless for gaining access to more than one machine.

Alarm circuits that rely on a coded switching arrangement to disarm the alarm circuit are difficult to circumvent without prior knowledge of the switching code or combination. The usual way for a professional thief to circumvent the combination is to drill a hole in the vending machine in the proximate area of some component of the alarm circuit and to thereafter cut a circuit wire by the manipulation of a suitable cutting tool through the drilled accessway. When circuit selector switches are used in such alarm circuits, the internal location of the switches is usually pinpointed for the thief by the external location of the knobs that are commonly used for their manipulation to the desired combination. Moreover the professional thief learns to recognize alarm systems and from prior knowledge of the packaging and mounting arrangements used by manufacturers and installers, is frequently able to ascertain

from the external knob locations, the internal locations of those components of the alarm circuit which have wires that are most accessible to the manipulation of a cutting tool through a drilled accessway.

A general object of the invention is to provide an improved alarm device for protecting vending machines from unauthorized break ins. Yet another object is to provide an alarm device that is equipped with a coded selector switch arrangement for use in disarming the alarm circuit and which can be mounted in a manner such that the means for manipulation of the selector switches are generally obscured from the normal view at the exterior of the machine and hence not accessible to the normal vandal and petty thief but which are nevertheless accessible to manipulation by an authorized person or repairman. Yet another object of the invention is to provide an alarm device for protecting vending machines and where the circuit components can be dispersed within the machine during the installation and in arrangements that need not be followed in making similar installations in other machines. A further object is to provide an inexpensive, self-contained alarm device for protecting vending machines and which can be readily installed on practically any type of vending machine without major modifications to the machine and which additionally contains circuit components that can be moved about and randomly dispersed after installation so as to avoid an established arrangement of components that can be followed from one machine to the next by professional thieves.

SUMMARY OF THE INVENTION

The alarm circuit has an arming and disarming mechanism which includes at least one circuit selector switch. The circuit selector switch or switches are mounted in a housing component of the alarm device and in lieu of externally located knobs for use in manipulation of the switches, the switches are equipped with rotatable elements that can be manipulated by engagement with a screwdriver, allen wrench or similar small tools to establish the circuit disarming combination. The housing for the switches is mounted in a compartment in the vending machine and in a position such that the ends of the rotatable elements are inwardly offset from the exterior wall surfaces of the machine. The wall is in turn provided with a suitable small hole for each rotatable element and through which the element can be manipulated by means of the tool. This arrangement obscures the circuit selector switches from normal view at the exterior of the vending machine and the housing makes it difficult for a probing thief to locate wires utilized in connecting the circuit components.

The alarm circuit includes a door actuated switch that is appropriately mounted in the compartment to complete and thus energize the alarm circuit when the door is open. It also includes a battery and audible noise producing device. The battery and audible sound producing device are housed in a separate housing for these circuit components and this housing merely rests in the compartment and can be moved around at will to any desired location in the machine. The circuit components are connected in an appropriate series circuit that includes wire components which interconnect the housed components. However the arrangement enables the components to be more or less dispersed in the machine and at random locations that need not be

followed in equipping other like machines with identical devices.

The novel features which are believed to be characteristic of this invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and method of operation, together with further objects and advantages thereof may best be understood by reference to the following description taken in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagram schematically illustrating the principal components of the alarm circuit of the signaling device;

FIG. 2 is an isometric view of the housed components of the alarm circuit as seen when mounted in a compartment of a vending machine, certain parts being broken away;

FIG. 3 is an enlarged sectional view taken generally along the lines 3—3 of FIG. 2 to illustrate the arrangement used in mounting the disarming mechanism within the compartment, certain parts being broken away to better illustrate the arrangement;

FIG. 4 is an elevational view as generally seen along the lines 4—4 of FIG. 3; and

FIG. 5 is an end view of one selector switching component as seen generally along the lines 5—5 of FIG. 3.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Reference is now made to the drawings and wherein in FIG. 2 the signaling or alarm device 10 is seen as mounted in a compartment 11 of a product vending machine 12. The compartment has an exterior side wall 13, an internal shelf 14, and a door 15 that is hinged by means not shown to swing between an opened and a closed position in the entranceway 16 to the compartment area. The door is equipped with a conventional handle and a key actuated door latch 18 for locking the door in the closed position.

The signaling device 10 includes an alarm circuit 20 that is self-contained and which includes a DC power source, shown in the form of a DC battery 21, energizable means for producing an audible sound, shown in the form of a pair of series connected horns 22 and 23, a door actuated switch component 24 with a pair of terminals, 24a and 24b, and a mechanism 25 that is manipulatable to arm and disarm the alarm circuit 20. The battery 21, horns 22 and 23, switch 24 and disarming mechanism 25 are connected in a series circuit by means of circuit lead components 26, 27, 28, 29 and 30 as seen in FIG. 1.

The arming and disarming mechanism 25 may comprise one or more circuit selector switches. In the illustrated embodiment the mechanism comprises two such circuit selector switches designated at 32 and 33. These switches are connected in series with the other circuit components of the alarm circuit and are connected in a parallel arrangement with each other.

Each of the circuit selector switches 32 and 33 includes a wiper blade 34 that is electrically connected by a lead to one terminal 35 of the mechanism 25. These leads are designated in the drawings at 36 and 37 for switches 32 and 33 respectively. Each wiper blade of the selector switch is fixed to a rotatable element 38

that is rotated about an axis 39 (see FIG. 3) in the assembled switch. Each wiper blade is arranged to contact one of a plurality of switch contacts 40 at each of its switching positions, and these contacts are offset radially of the axis 39 of rotation of the element, as generally depicted in FIG. 1. Each contact 40 has a switch terminal 41 that is located at one end of the assembled selector switch (see FIGS. 3 and 5) and all but one of these terminals 41 in each selector switch assembly are electrically interconnected by a lead wire 42 that is mounted on the switch and electrically connected by another lead to the other terminal 43 of the disarming mechanism. These other leads for switches 32 and 33 are designated at 44 and 45 respectively.

The selector switches 32 and 33 of mechanism 25 are housed in a separate housing 47 in the illustrated embodiment. As best seen in FIG. 3, this housing comprises a hollow box-like structure 48 which is equipped with a cover plate 49. The selector switches 32 and 33 are mounted on this cover plate in a manner such that the contacts and the switch terminals are located internally of the box-like structure while the rotatable elements 38 are manipulatable from the exterior of the housing.

In mounting the alarm device 10 in the vending machine 12, housing 47 is mounted within the compartment 11 and on the exterior side wall 13 by means of appropriately spaced screw elements 50. Each screw element extends through a spacer sleeve 51 and thence through the cover plate 49 into a corner boss element 52 that is molded in the box-like structure for reception of the fastener. Each rotatable element 38 in the illustrated embodiment has an end slot or recess 53 which is adapted to receive the working end 54 of a screwdriver 55 so that the element can be rotatably manipulated through manipulation of the screwdriver to the armed and disarmed switching positions for the switch. The housing 47 is so mounted on the side wall 13 that the axis of rotation of each element is normal to the plane of the wall and the slotted end 56 of the rotatable element is inwardly offset from the exterior surface 57 of the side wall. Hence the side wall is provided with a hole which is axially aligned with the element 38 of the switch component for reception of the working end of the screwdriver.

Switch 24 is of a conventional type and is equipped with a plunger 60 that carries a pole piece 61. The plunger 60 is urged into the closed position at which the pole piece completes the alarm circuit between contacts 62 and 63 by means of a compression spring 64. The main components of the switch are housed in a housing 65 that is securely mounted on the shelf of the machine and in an arrangement such that the plunger is engaged by the door when the door is in the closed position. In this closed position, the door maintains the switch in an open position. On the other hand, when the door is opened, the door disengages the plunger and spring 45 urges the pole piece in a closed position with respect to the switch contacts 62 and 63. This completes and energizes the alarm circuit to sound the alarm when the circuit is armed.

The horns 22 and 23 and battery 21 are housed in a separate housing that is designated at 67. This housing 67 merely rests in the compartment in an appropriate position, as for example on the shelf 14, and may be moved about to any convenient location within the compartment as the need or desire arises.

The alarm circuit as seen in FIG. 1 is shown in a disarmed condition at which each of the wiper blades 34 of switches 32 and 33 is in contact with the open circuit contact 68 of the switch. This establishes an opened or broken circuit connection between the terminals of switch 24 so that the door can be opened without sounding the alarm. The circuit is armed by manipulating either one or both of the rotatable elements 38 into a position such that its wiper blade is in contact with one of the closed circuit contacts 69 of the switch. This completes an electrically conductive circuit connection between the switch terminals 24a and 24b. When the circuit 20 is thus armed and the door is opened, the pole piece 61 is urged by the spring into contact with contacts 62 and 63. This completes the electrical circuit, and of course, energizes the horns to sound the alarm.

There are several advantages to the embodiment illustrated. For one, all of the components of the alarm are located internally of the machine and the alarm device is wholly self-contained so that a thief cannot disarm the device by cutting externally located wires and circuit connectors. Additionally, there are no external knobs which can become the target for vandals that are unable to gain access to the machine. Although the disarming mechanism can be pinpointed from the exterior of the machine by a professional thief, he will nevertheless have difficulty locating and gaining access to wires that can be cut through a drilled hole. Thus the pinpointed circuit components are separately housed in their mounted position in the machine while the other components of the alarm circuit can be randomly located during the installation so that a common pattern is not followed from one machine to the next. Additionally, the separately housed horn and battery components of the alarm circuit may be moved about in the compartment even after the machine has been equipped with the alarm device. This additionally avoids a location pattern that can be followed by a thief from one machine to the next and causes the risk of detection to outweigh the rewards of the unlawful act.

While only a certain preferred embodiment of this invention has been shown and described by way of illustration, many modifications will occur to those skilled in the art and it is, therefore, desired that it be understood that it is intended herein to cover all such modifications as fall within the true spirit and scope of this invention.

What is claimed as new and what it is desired to se-

cure by Letters Patent of the United States is:

1. In a product vending machine having an internal compartment with an external wall, an exterior door closing an entranceway to said compartment and being movable to an open position, and a signaling device for signaling an unauthorized opening of said door, the improvement where said device includes an alarm circuit comprising an open switch component which closes in response to opening movement of the door and has a pair of terminals, circuit components for establishing an electrically conductive circuit connection between said terminals including a DC battery, sound producing means connected in series with the battery and energizable by completion of the alarm circuit to sound an audible alarm, and a mechanism for arming and disarming said alarm circuit, said device including a housing for said mechanism which is located in said compartment and mounted on said wall, and a housing for said DC battery and said sound producing means which is restingly located within said compartment and randomly locatable therein, said mechanism comprising a switching component connected in series with said battery and said sound producing means and being manipulatable to make and break said conductive circuit connection, said switching component having an element that is rotatably manipulatable about an axis to selectable positions which include a plurality of positions at each of which said circuit connection is complete, and a position at which said circuit connection is broken, said element being manipulatable at the exterior of the housing for said mechanism and inwardly offset from the exterior surface of the wall, said element being arranged with its axis normal to the exterior wall surface and having an end with a recess shaped to receive the working end of a tool for use in the rotative manipulation thereof, and said wall having an opening which is arranged in working alignment with the end of said element and arranged to receive the working end of the tool.

2. The improvement in accord with claim 1 where said switching component has a plurality of terminals located within the housing for said mechanism, each of said plurality of terminals being associated with a respective one of said selectable positions, and wire means electrically interconnecting the terminals associated with said plurality of positions and forming a circuit component of said circuit connection.

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