Nov. 23, 1937. W. F. SUTHERLIN 2,099,761

SAFETY SWITCH BOX

Filed Dec. 26, 1935 2 Sheets-Sheet 1

Fig. 1

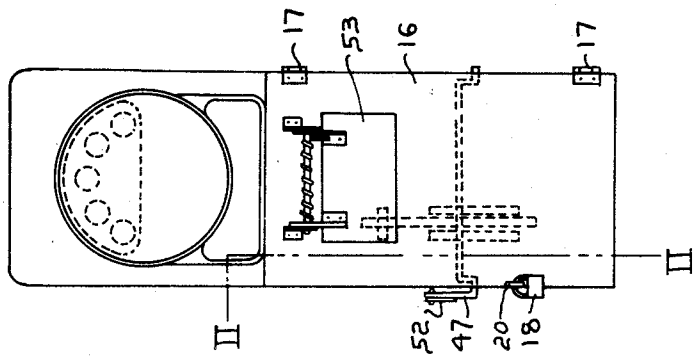


Fig. 2

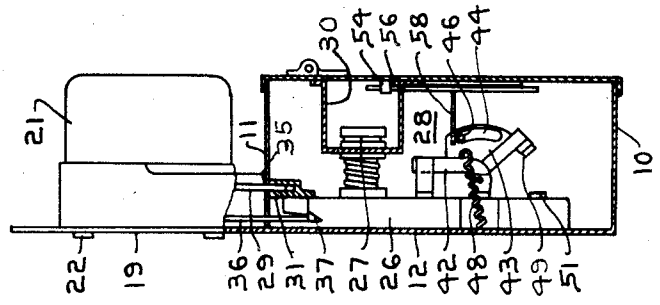
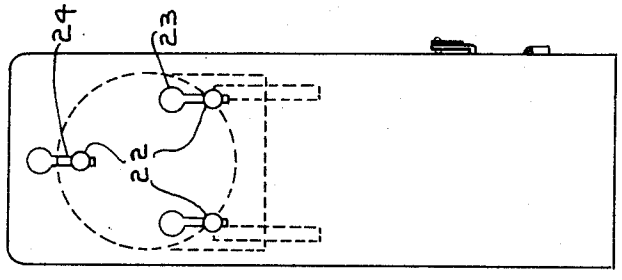


Fig. 3



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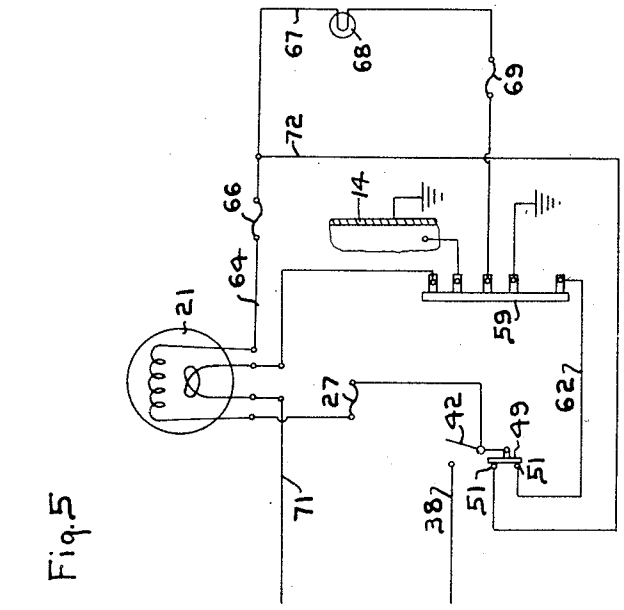


Fig. 5

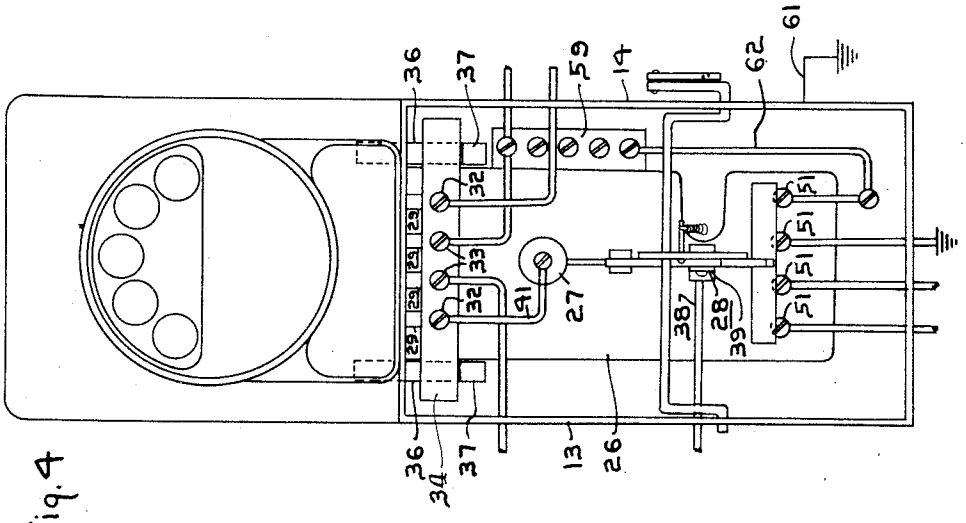


Fig. 4

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Patented Nov. 23, 1937

2,099,761

UNITED STATES PATENT OFFICE

2,099,761

SAFETY SWITCH BOX

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Application December 26, 1935, Serial No. 56,194

4 Claims. (Cl. 171—34)

This invention relates to switch boxes, and has for an object the provision of a switch box which will prevent the stealing of electric current or the jumping of meters so as to obtain electric current without the current passing through the meter.

Another object of the invention is to provide a short circuiting device in the switch box, which, when the main switch is open, automatically short circuits the work circuits.

Another object of the invention is to provide a door giving access to the main fuse in the switch box, and an automatic locking means therefor, barring access to the fuse without opening the switch.

Another object of the invention is to provide a safety switch box with means for locking the switch in open position, as when premises are unoccupied, to prevent the unauthorized closing of the switch.

Another object of the invention is the provision of a toggle make and break main switch so arranged that the work circuits are short circuited when the main switch is open.

A still further object of the invention is to provide a means for detachably mounting a meter on the switch box which may only be removed when the switch box is unlocked and opened, thereby preventing wiring around the meter.

As is well known, numerous devices are employed for stealing current from an electric lighting company by unscrupulous persons. Where the meter is separate from the switch box, devices are employed for wiring around the meter so that a part, if not all, of the current used passes around the meter instead of going through it. Also, where a building has been unoccupied, some people have defrauded the lighting company by closing the main switch in the switch box and connect up the electric current without notifying the lighting company. It has also been known to run wires from adjoining sources around the meter to connect with the work circuits so that no current can pass through the meter. It has also been known to ground the work circuit in some concealed place and to connect the ground wire to the meter in such a way that it would not be observed and so that no current passes into the potential coil of the meter, thereby preventing the meter from operating.

All of these means of obtaining electric current dishonestly are obviated by means of my invention. In order to prevent wiring around the meter, I provide a means for detachably mounting the meter on the switch box so that no connections between the switch box and the meter are accessible. The meter may be readily removed, when desired, by authorized persons, by unlocking the switch box, whereby access to the fastening means may be obtained. I also provide a means whereby the switch may be locked in open position when the premises are vacated, thereby preventing unauthorized closing of the main switch. In order to prevent wiring around the meter from an outside source and thereby obtaining electric current, I provide a short circuiting device within the switch box, operable when the main switch is open, which short circuits the work circuits so that no current can pass into the work circuits until the main switch is closed.

Apparatus embodying features of my invention is illustrated in the accompanying drawings forming a part of this application, in which

Fig. 1 is a plan view of my improved switch box with the meter in place thereon;

Fig. 2 is a sectional view taken along the line II—II of Fig. 1;

Fig. 3 is a back view of the switch box;

Fig. 4 is a front view of the switch box and meter with the switch box cover removed and showing the electric connections; and

Fig. 5 is a diagrammatic view showing the means whereby the work circuits are short circuited and grounded when the main switch is open.

Referring to the drawings, my improved switch box comprises ends **10** and **11**, a bottom **12**, and sides **13** and **14**. A cover **16** is hinged to the side **13**, by hinges **17**, and may be held closed by means of a padlock **18**, having its fastening element passing through a staple **20** extending through the cover **16** from the side of the switch box.

The bottom **12** is extended upwardly at the rear, as shown at **19**, to support a meter **21**. The meter **21** is supported on the extension **19** by means of button head rivets **22** on the back of the meter, which are passed through suitable openings **23** and into slots **24**. Moving the meter downwardly with the rivets **22** in the slots **24**, fixes it securely on the extension **19**.

Within the switch box is mounted a fuse block **26** made of insulating material, which carries the main fuse **27**. As shown in Figs. 2 and 4 of the drawings, the meter **21** is connected electrically to the switch box by means of prongs **29** which extend downwardly into suitable sockets **31** provided in the fuse block **26**, there being corresponding openings **35** in the end of the switch box

to allow the prongs to enter the sockets. The line circuit connections are at 32 and the ground connections to the meter at 33. The fuse 27, as shown in Fig. 2 of the drawings, is surrounded by a housing 36 which prevents access to the switch 28 and electrical connections around the fuse.

Extending across the upper end of the fuse block 26 is a bar 34. Carried by the meter, on each side thereof, is a resilient latch member 36 having on its lower end a hook 37 which engages automatically with the bar 34 when the meter is mounted on the extension 19 as described. The hooks 37 may be disengaged from the bar 34 only when the door 16 is unlocked and open. Access may then be had to the hooks 37 to press them rearwardly and disengage them from the bar 34 for the purpose of removing the meter.

The main switch 28, as shown in Fig. 2 of the drawings, is mounted upon the fuse block 26 and is connected to the line 38 at 39. When the main switch is closed, as shown in Fig. 2 of the drawings, the line passes through the switch to the main fuse 27 and from thence through a connection 41 to the meter connection 32. The main switch 28, as shown in Fig. 2, comprises a bar 42 which serves to connect the line to the meter, as just described, when the switch is closed.

Mounted upon the bar 42 is a plate of insulating material 43 having a slot 44 therein. The switch is opened and closed by means of a bell crank lever 46 extending across the box and movable in the slot 44 by means of a handle 47 extending outside the box. The switch is biased to closed position or open position by means of a spring 48, connected to the plate 43, and to the bottom of the box, as shown.

Carried by the plate 43 on the opposite side from the main switch bar 42 is a bar 49 of conducting material so disposed that when the main switch is thrown to open position, it serves to connect a plurality of terminals 51 and short circuit the electrical connections made thereto. When thrown to open position the spring 48 serves to draw the bar 49 down tightly against the terminals 51. It will thus be seen that the switch 28 can not be thrown to open the main circuit without short circuiting across the terminals 51, nor can it be thrown to a position to raise the bar off the terminals 51 without closing the main switch by reason of the spring 48. The handle 47 is provided with a link 52 which, when the main switch is open, may be swung to a position to be engaged by the lock 18 when the main switch 28 is opened. The main switch may thus be locked in open position by means of the lock 18, which serves to close the switch box. By this means, unauthorized closing of the switch is prevented.

As is customary in switch boxes, access to the main fuse 27 is had by means of a small spring pressed door 53. On the under side of the door 53 is provided a strap 54 through which a bolt 56 passes. The bolt 56 is actuated by means of a pin 58 extending inwardly of the box in the path of the switch lever 46, so that when the switch 28 is thrown to closed position, as shown in Fig. 2, the lever 46 strikes the pin 58 and moves the bolt 56 into locking position. When the switch 28 is opened, the bolt 56 falls by gravity to disengage it from the strap 54. By this arrangement it is necessary, in order to gain access to the main fuse 27, to open the main switch 28.

Within the switch box is located a ground strip of conducting material 59, which ground strip is connected, as shown in Fig. 4, to any suitable ground connection, as shown at 61. One of the terminals 51 is connected to the ground strip 59 within the box by means of a connection 62 so that when the main switch is thrown to open position with the conducting bar 49 across the terminals 51, all circuits leading thereto are grounded. It is also preferable that one of the terminals 51 also be connected directly to the ground outside the box, as shown in the drawings.

Referring now to Fig. 5, I show diagrammatically the operation of the short circuiting feature of my invention. The line circuit is shown at 38 and passes through the switch bar 42, when the switch is in closed position, thence through the main fuse 27 and meter 21. From the meter 21, the circuit continues through a connection 64 and house fuse 66 to a work circuit 67, thence through a light or other current consuming device 68. From the current consuming device the current continues through a house fuse 69 to the ground strip 59, and from thence back through the meter 21 to the return line 71.

In accordance with my invention, I connect a conductor 72 to the work circuit beyond the fuse 66, and from thence to one of the terminals 51 in the switch box. The other terminal 51 being connected directly to the ground, it will be seen that the work circuit, when the switch 28 is in open position, as shown in Fig. 5, is connected directly to the ground. If any attempt be made to obtain current without passing the current through the meter, it will be seen that the conductor 49 serves to short circuit the work circuit so that no current can be obtained.

From the foregoing, it will be apparent that I have devised an improved switch box which is simple and economical of manufacture, and which is adapted to prevent theft of current. The mounting of the meter on the switch box with the prong and socket connections prevents tampering with the connections between the meter and the switch box, while the means for locking the meter on to the switch box prevents its unauthorized removal for the purpose of tampering with the connections. The means provided for locking the switch in open position prevents unauthorized closing of the switch where previously unoccupied premises become occupied. The short circulating device incorporated in the switch box insures that if wiring from an outside source is carried in around the meter no current can be obtained, because the work circuits are automatically grounded.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications, without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are imposed by the prior art or as are specifically set forth in the appended claims.

What I claim is:

1. In switch apparatus of the character described, a switch box, a meter, terminals in the switch box connected to a power line, to a work circuit and to the ground, terminals in the switch box connected to the meter coils, and a double throw spring pressed switch in the switch box so disposed that when closed on one side the power line is connected to the work circuit through the meter coils, and when closed on the other side the work circuit beyond the meter is connected to the ground.

2. In switch apparatus of the character de-

scribed, a switch box, a meter, ground connection terminals in the switch box, a work circuit, terminals in the switch box for the work circuit and the meter coils, a double throw spring pressed switch in the switch box for controlling the work circuit in one position, a connection from the other side of the switch to the work circuit beyond the meter, a connection from said other side of the switch to the ground, said connections being placed in circuit by the double throw switch when the work circuit through the switch box and meter is open.

3. In switch apparatus of the character described, a switch box, a meter mounted on the switch box, a door and lock therefor on the switch box, a spring pressed double throw switch mounted in the switch box, a line circuit leading to one side of the switch, a work circuit adapted to be connected to the line circuit by the switch in one position through the switch and the meter coils, a connection from the other side of the switch to the ground, a terminal at said other side of the switch connected to the work circuit beyond the meter, and a conductor carried by the switch to connect said ground connection and said terminal when the work circuit is open.

4. In apparatus of the character described, a switch box, a meter mounted thereon, a door and lock for the switch box, terminals in the switch box connected to a line circuit, the meter coils, a work circuit, and to the ground, and a double throw switch disposed when closed on one side to connect the line circuit with the meter coils and work circuit through said terminals, and when closed on the other side to disconnect the line circuit and connect the work circuit to the ground through said terminals.

WALTER F. SUTHERLIN.