Feb. 21, 1933. M. J. LEWIS 1,898,634

SERVICE BOX

Filed Jan. 28, 1929 2 Sheets-Sheet 1

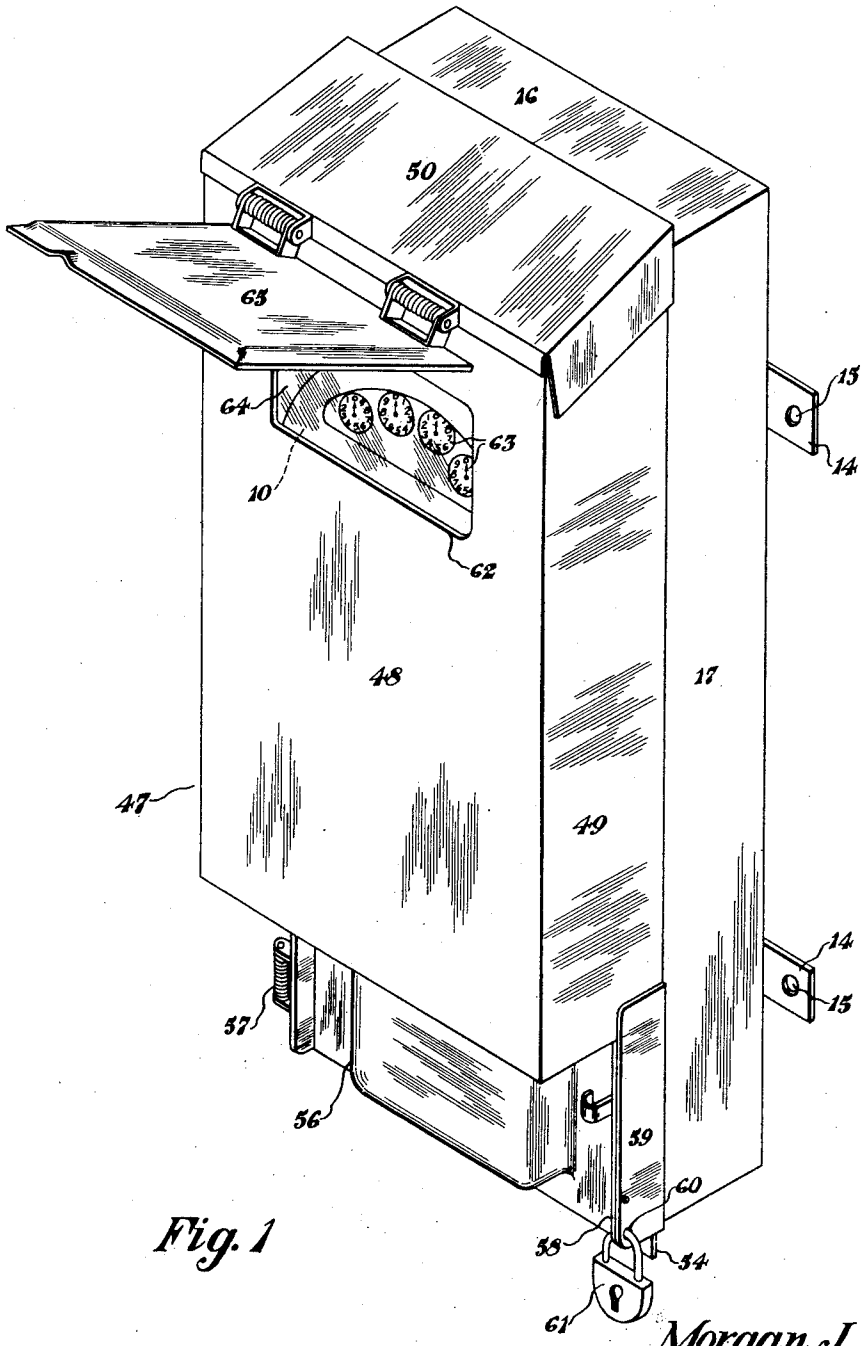


Fig. 1

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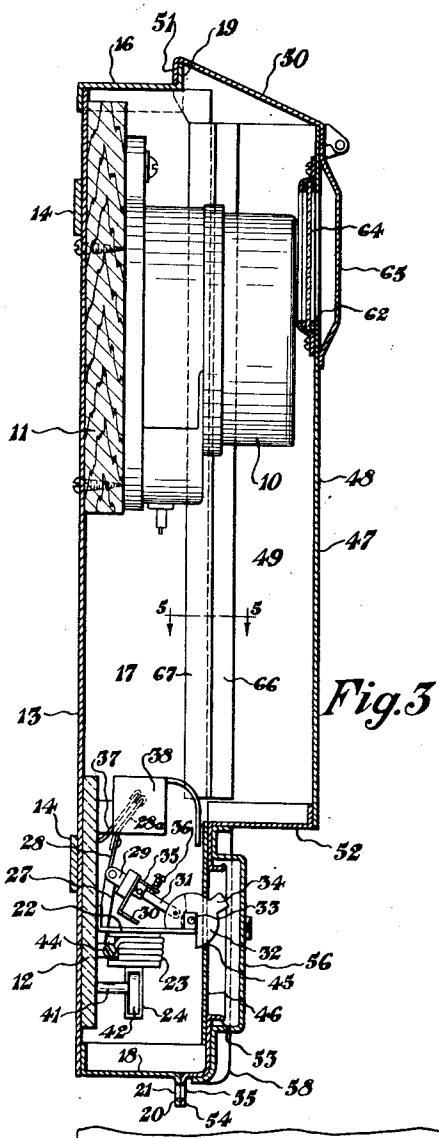


Fig. 3

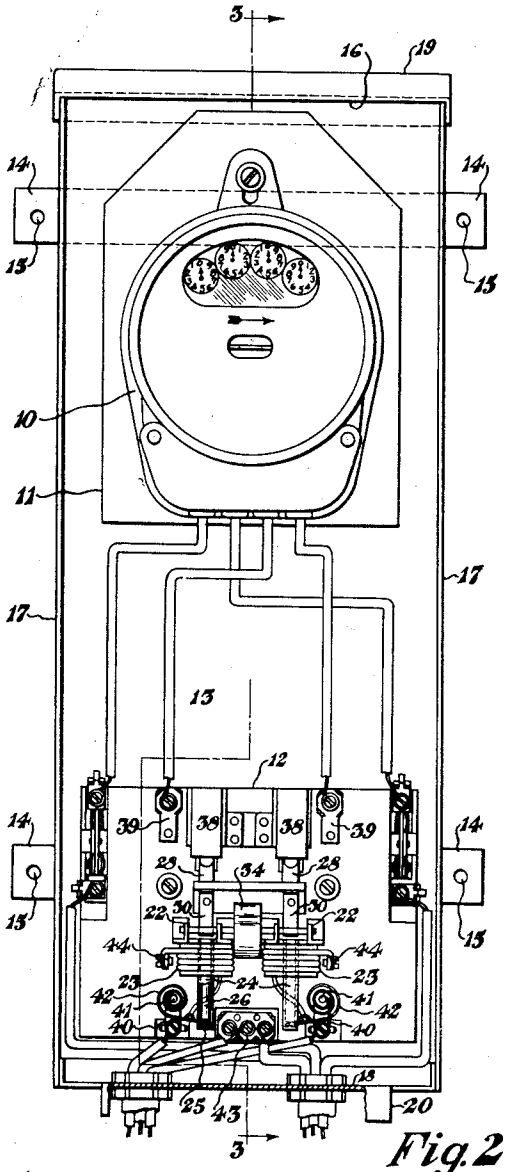


Fig. 2

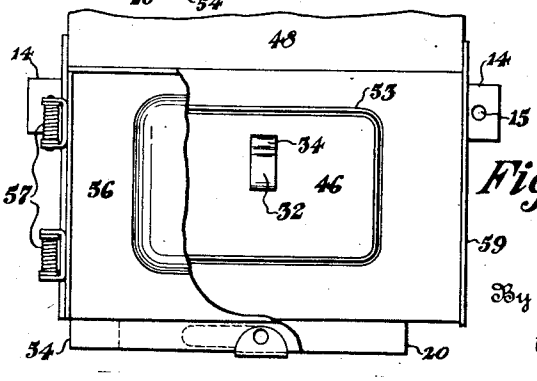


Fig. 4

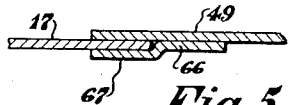


Fig. 5

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1,898,634

UNITED STATES PATENT OFFICE

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SERVICE BOX

Application filed January 28, 1929. Serial No. 335,605.

The invention relates to boxes adapted for use at the entrance to buildings, for housing an electric meter and circuit breaker, and more particularly to a box of this general character adapted to be located upon the exterior of the building in order to permit reading of the meter by an employee of the power company, without the necessity of entering the house.

The objects of the improvement are to provide a box of this character, for housing a meter and a circuit breaker adapted to take the place of the usual switch and fuses, the circuit breaker being arranged to automatically open the circuit upon the occurrence of an abnormal overload and having means for manually opening and closing the circuit.

A further object is to provide means for maintaining the manual operating means for the circuit breaker normally inaccessible, while at the same time the customer may have access thereto whenever desired, in order to manually close the circuit after the same has been automatically opened.

Further objects of the improvement are to provide such a box in which the meter and circuit breaker are properly protected from the elements; to provide for keeping all of the parts normally enclosed and locked against unauthorized access, while providing for ready, authorized access to the interior of the box, by employees of the power company to test the meter, make repairs and the like

An embodiment of the invention is illustrated in the accompanying drawings, in which

Figure 1 is a perspective view of the improved box, showing the cover and auxiliary door in closed position, and the protective shield for the meter dials in raised position to permit reading of the meter;

Fig. 2, a front elevation of the box with the cover removed, showing the location and relation of the meter and circuit breaker;

Fig. 3, a vertical, longitudinal section through the box, taken substantially as on the line 3—3, Fig. 2, showing the cover and auxiliary door in closed position;

Fig. 4, a fragmentary elevation of the lower portion of the box, with a part of the auxiliary door broken away to disclose the manually operated handle of the circuit breaker; and

Fig. 5, an enlarged section taken as on the line 5—5, Fig. 3.

Similar numerals refer to similar parts throughout the drawings.

The box may be of sheet metal, and is substantially rectangular in shape, and of sufficient dimensions to house the meter 10, which is mounted upon a panel 11, of wood or insulation material, and the circuit breaker, located preferably at the lower end of the box, and mounted upon the insulation panel or block 12, which, together with the panel 11, is secured upon the back wall 13 of the box.

Ears 14, provided with apertures 15 to receive screws or the like, may be fixed upon the back wall of the box, or other suitable means may be provided for securely attaching the box to the outer wall of a building.

The top wall 16, side walls 17, and bottom wall 18 may be permanently attached to the back wall 13 of the box, by welding or the like, as illustrated in the drawings, or if desired all of these parts may be formed integrally with the back wall.

At the forward edge of the top wall an upturned flange 19 is preferably formed, at a point spaced slightly in rear of the front edges of the side walls 17, and a depending flange 20, provided with an aperture 21, may be formed at the forward edge of the bottom wall 18 of the box.

The usual switch and fuses are dispensed with and in their stead I provide a circuit breaker which takes the place of both switch and fuses. This circuit breaker may be of any suitable type, but for the purpose of illustration I have shown a form of circuit breaker especially adapted for the purpose.

One or any desired number of the circuit breakers may be mounted upon a panel, but they are preferably mounted in pairs, as shown in Fig. 2 of the drawings.

Each circuit breaker may include a bracket 22, fixed upon the insulation block 12, a

solenoid coil 23 depending from the bracket. A tube 24 is secured in the center of the solenoid coil and capped at its lower end by a cap 25, an armature 26 being longitudinally movable within the tube.

The blade carrier 27 is pivoted upon the bracket 22, and carries the spring 28, which projects upward, beyond the carrier and has fixed thereto the detachable contact 28*a*. A link 29 is pivoted to the carrier and provided with a foot 30, disposed in alinement with the armature when the circuit is closed.

A link 31 is pivotally connected to the link 29, and also pivoted to the hub 32, journaled as upon the pin 33, carried by the bracket 22, and provided with a handle 34. An ear 35 projects from the link 29 and carries a set screw 36 adapted to contact with the link 31, to regulate the limit of movement of the links toward the bracket.

Fixed upon the insulation panel 12 is a contact 37, which extends within the shield 38, for engagement with the contact spring 28*a*, and is connected, as by a conductor recessed within the panel, to the terminal 39.

A conducting bracket 40 is fixed upon the panel 12, and provided with a conducting post 41, on which is coiled a thermostatic conductor 42, formed of laminated strips of metals having different coefficients of expansion, the end of said thermostatic conductor projecting through a slot in the cap 25, beneath the armature 26, which normally rests thereon.

The bracket 40 is connected, as by a conductor recessed within the insulation block 12, with the line terminal 43. The thermostatic conductor 42 is connected with one end of the coil 23, the other end of the coil being connected to a binding post 44 which is connected by a suitable conductor with the switch blade 28.

The hub 32 has a segment cut out from the periphery thereof, opposite to the handle 34, forming stops which engage with the bracket to limit the throw of the handle in each direction. The peripheral segment of the hub forms a closure for the slot 45 in the front wall 46 in all positions of the handle.

With the handle 34 in the upper position shown in Fig. 3, the hub and link mechanism is so positioned as to rock the blade carrier 27 toward the insulation block 12, against the action of the spring blade 28, bringing the contact 28*a* into engagement with the contact 37 and closing the circuit. The parts are so positioned that when the circuit is closed the several pivots in the link mechanism are not in a straight line.

The circuit leads from the line through the circuit breaker and meter to the house and when normal current flows from the line, the magnetic portion of the armature is below the portative force of the magnetic field created by the passage of normal current through the coil, and the thermostatic conductor has such conductivity that it is not heated or bent by the flow of normal current.

The portative force of the magnetic field resulting from a supply overload is insufficient to lift the armature from its normal position at the bottom of the tube, but the continued flow of such overload through the thermostatic conductor heats the metals thereof and expands them unequally, causing the coiled portion thereof to elevate the projecting end.

The magnetic portion of the armature is thereby lifted into a more intense zone of the magnetic field of the solenoid coil which attracts the armature and moves it against the foot 30 with sufficient force to break the joint between the links 29 and 31, permitting the spring 28 to open the circuit between the contacts 28*a* and 37.

When an abnormal overload occurs, such as results from a short circuit or static discharge, likely to cause immediate damage, the magnetic field created by the passage thereof through the coil of the solenoid is sufficiently strong to immediately attract the armature and cause it to break the toggle joint of the links without awaiting the heating of the thermostatic conductor.

The cover 47 may be of substantially the same depth as the box throughout the greater portion of its length and comprises the front wall 48, side walls 49, and the preferably inclined top wall 50 having the depending flange 51 at its rear edge adapted to overlap the upright flange 19 upon the front edge of the top wall of the box.

The substantially horizontal wall 52 may be provided near the lower end of the cover to which is fixed the lower front wall portion 46. The curved flange 53 may surround the opening 45 through which the hub 32 extends in order to prevent moisture or water from draining into the interior of the box, this flange forming a trough or groove to drain the water away from said opening.

A depending flange 54 may be formed at the lower end of the front wall and provided with an opening 55 adapted to register with the opening 21 in the flange 20 of the box in order to permit a lock or seal to be located through the same to prevent unauthorized access to the interior of the box.

An auxiliary door 56 may be hinged as at 57 upon the lower front wall and arranged to normally cover the handle 34. This door may be provided with a flange 58 adapted to register with the flange 59 formed at one side of the cover, said flanges having openings 60 therein adapted to register with each other when the auxiliary door is closed, to receive a lock or the like as shown at 61,

whereby only the customer may have access to the handle 34.

The upper portion of the front wall 48 is provided with an opening 62 registering with the dials 63 of the meter and provided with the glass panel 64 which may be shielded as by the hinged lid 65 adapted to be raised for the purpose of reading the meter as shown in Fig. 1.

For the purpose of forming a water-tight joint between the box proper and the cover, a channel is formed at the inner edges of the side walls 49 of the cover, this channel being preferably formed by welding or otherwise connecting a sheet strip 66 to each side wall 49 of the cover at a point spaced from the inner edge thereof, this sheet strip being offset as at 67 a sufficient distance to receive the edge portion of the corresponding side wall 17 of the box proper.

With this construction, even though a garden hose is turned upon the box, it will be seen that the water will be deflected and not enter the box.

In the operation of the device, it will be seen that the ordinary fuses and switch usually provided in an entrance box are not necessary as the circuit breaker takes the place of both.

Upon the occurrence of an abnormal overload the circuit breaker will immediately operate to automatically open the circuit and in the same manner, if an overload of limited amount continues for any appreciable time the circuit breaker operates to automatically open the circuit, thus functioning in the same manner as a fuse.

This construction eliminates the necessity of replacing fuses as it will be seen that when the circuit is thus automatically broken it is only necessary for the consumer to unlock the auxiliary door, open the same and throw the handle 34 back to the upper position as shown in Fig. 3, operating the circuit breaker to close the circuit.

If at any time it is desirable or necessary to open the circuit, it is only necessary to throw the handle 34 to the down position, breaking the circuit, the circuit breaker thus functioning in the same manner as the ordinary switch.

When an employee of the power company wishes to have access to the interior of the box to make repairs, test the meter or the like, this may be done by removing the lock or seal from the apertures in the flanges 20 and 54, permitting removal of the entire cover without disturbing the consumer's lock upon the auxiliary door, when access may be had to the entire interior of the box, as shown in Fig. 2.

I claim:

1. A weatherproof entrance box, a meter and a magnetic circuit breaker enclosed in the box, said circuit breaker being arranged to automatically break the circuit upon the occurrence of an overload, means comprising a handle completely housed within said box for manually operating the circuit breaker, means for preventing unauthorized access to the meter and circuit breaker, and separate means for preventing unauthorized access to said means for manually operating the circuit breaker.

2. A weatherproof entrance box, a meter and a magnetic circuit breaker enclosed in the box, said circuit breaker being arranged to automatically break the circuit upon the occurrence of an overload, means comprising a handle completely housed within said box for manually operating the circuit breaker, a cover on the box for preventing unauthorized access to the meter and circuit breaker, and means for preventing unauthorized access to said means for manually operating the circuit breaker.

3. An entrance box, a meter in the box, a circuit breaker in the box, said circuit breaker being arranged to automatically break the circuit upon the occurrence of an overload, means comprising a handle completely housed within said box for manually operating the circuit breaker, an auxiliary door upon the cover, and locking means for the door for preventing unauthorized access to the manual operating means for the circuit breaker.

4. A weatherproof entrance box, a meter and a magnetic circuit breaker enclosed in the box, said circuit breaker being arranged to automatically break the circuit upon the occurrence of an overload, means comprising a handle completely housed within said box for manually operating the circuit breaker, a cover on the box, locking means on the cover for preventing unauthorized access to the meter and circuit breaker, an auxiliary door in the cover, and locking means on the auxiliary door for preventing unauthorized access to the means manually operating the circuit breaker.

In testimony that I claim the above, I have hereunto subscribed my name.

MORGAN J. LEWIS.