

June 9, 1959

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2,890,302

OPERATING MECHANISM FOR VARIABLE DEPTH ENCLOSURE

Filed Dec. 31, 1956

2 Sheets-Sheet 1

FIG. 1

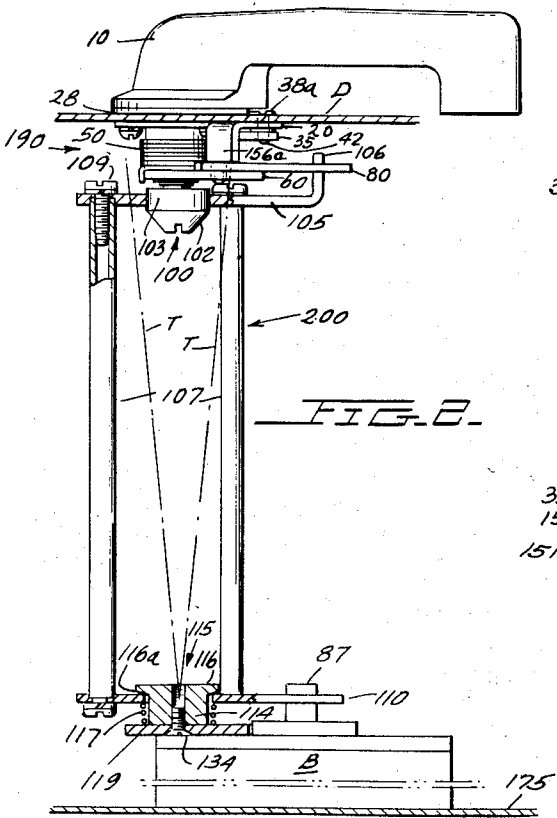
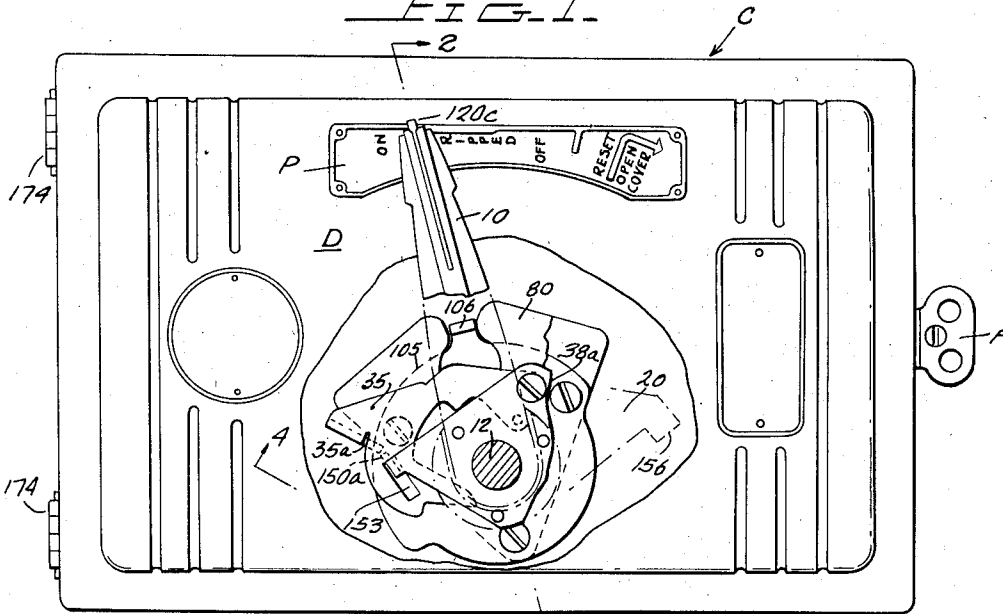


FIG. 3

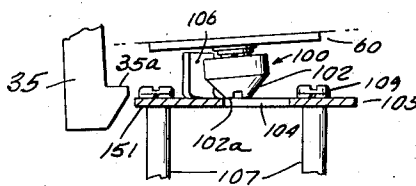
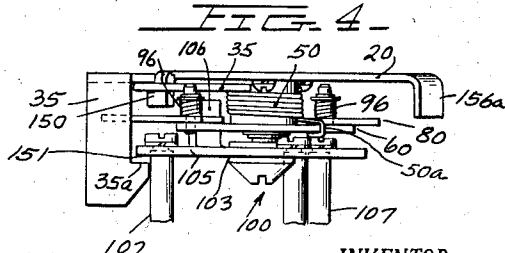


FIG. 4



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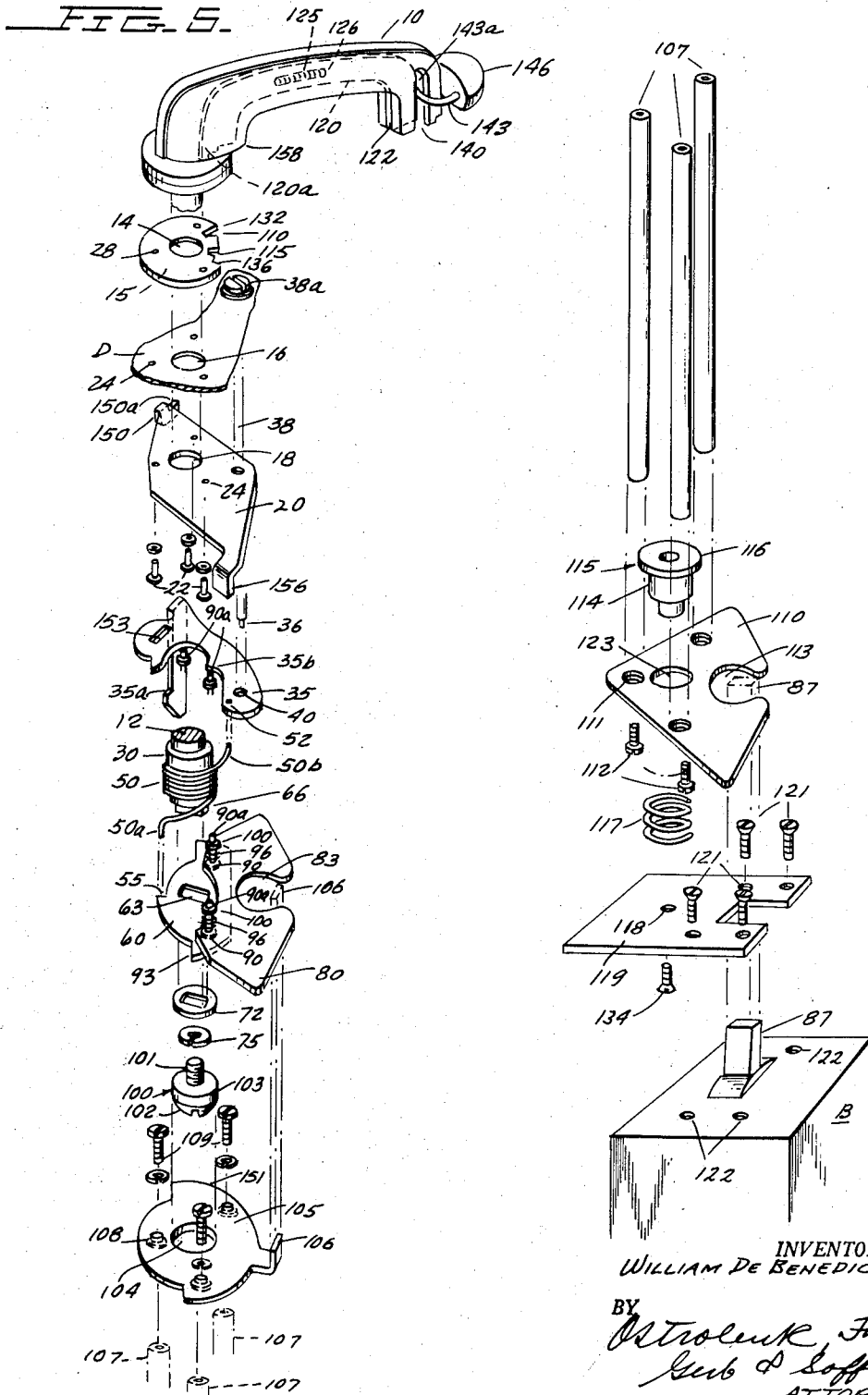
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2 Sheets-Sheet 2

FIG. 5.



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2,890,302

OPERATING MECHANISM FOR VARIABLE
DEPTH ENCLOSURE

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corporation of Pennsylvania

Application December 31, 1956, Serial No. 631,551

9 Claims. (Cl. 200—50)

This invention relates to an operating mechanism where-
by a circuit breaker mounted within an enclosure may be
operated from a handle external to the enclosure and
more particularly to an operating mechanism for variable
depth enclosures.

This invention contemplates the provision of a box hav-
ing a hinged cover which carries a rotary control handle
exteriorly thereon. A control plate is secured to the
control handle interiorly of the cover for rotation by
that handle, the plate being provided with a recess for
engaging an extended mechanism which is in operative
engagement with the circuit breaker unit control handle
so as to effect motion thereof when the exterior handle
is operated.

The extending mechanism is a rigid unit comprising a
plurality of parallel rods having their first ends rigidly
secured to a top plate having a tang projecting at right
angles therefrom to be engaged by the control plate, and
their second ends rigidly secured to a bottom plate having
an aperture cut therein. The extending mechanism is
rotatably mounted and is also resiliently mounted so that
it may be rocked slightly, with the circuit breaker control
handle being permanently positioned within the lower
plate aperture.

By using the extending mechanism, the same size box,
having the same control handle and operating mechanism
mounted to its cover may be used to enclose circuit
breakers of varying frame sizes. The only adjustment
required is in the lengths of the rods. That is, the lengths
of the rods must be such that the lower plate engages the
circuit breaker control handle and the control plate en-
gages the upper plate tang when the cover is closed.

Aligning means are included to compensate for mis-
alignment between the upper plate and the extending
mechanism. The aligning means includes a partially conical
member which is mounted to the control plate and is
received by a central hole in the upper plate. When
the enclosure cover is closed the smaller part of the conical
section enters the upper plate hole. If the control and
upper plates are out of alignment the conical section bears
against the upper plate and rocks the extending mech-
anism into alignment with the mechanism mounted on
the cover. The resilient mounting of the extending mech-
anism also insures alignment of the cover latching mech-
anism which comprises a hook shaped cover mounted
member whose tip is latched by the upper plate.

As more fully explained in copending application Serial
No. 421,753, filed April 8, 1954, and assigned to the as-
signee of the instant invention, the plate is resiliently
mounted so that it can tilt in a direction toward the cover
and away from the tang on the upper plate in the event
any part of the surface of the control plate should strike
the tang when the cover is slammed shut. Thus, under
such conditions, the tang would merely cause the control
plate to rock or tilt on its mounting without causing
any damage and operation of the exterior control handle
would then be restored to align the recess in the control
plate with the tang of the upper plate. In which case,

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the pressure causing tilting of the plate will be relaxed
and the control plate will snap into parallelism with the
cover and thus, the exterior handle and the circuit breaker
unit control handle will then be mechanically coupled so
that the exterior handle can take over control functions.

Further, the invention contemplates a latching mech-
anism carried by the cover wherein the cover is always in
latched condition with respect to the box, but wherein
motion of the exterior handle to a reset position, at an
extreme end of its arcuate path, will effect releasing of
the latch so that the cover may be opened.

Should it be desired to open the cover when the ex-
terior handle is in some intermediate position or even at
the other extreme of its arcuate path, this can be done
by a latch defeater mechanism having a slotted button
exposed through the cover and accessible to a tool fitting
into the slot to rotate the button. However, the con-
struction and positioning of the button is such that it is
covered by the exterior handle and not accessible when
that handle is in the "off" position. Thus, a repair man
placing the exterior handle to "off" position and pad-
locking it in such position may safely go about repair
work without fear that some other person will inad-
vertently throw the handle to the "on" position or will be
able to defeat the latch so as to open the breaker and
throw the circuit breaker unit handle to the "on" posi-
tion. Thus, the slotted button is completely obstructed
by the exterior handle when the exterior handle is set
at the "off" position according to an indicia plate provided
on the front of the cover.

The construction is such that all functions of the circuit
breaker unit can be effected without opening the cover;
thus, the exterior handle can be swung from an "on"
position to an "off" position and thereafter to a "reset"
position at which position the latch holding the cover
closed is released. The construction is also such that in
the event of the opening of the circuit breaker unit due
to overload, the exterior handle will then be driven by the
circuit breaker unit handle to a position where it indi-
cates "tripped" on the indicia plate so that the condition
of the circuit breaker unit will be readily observable.

This invention enables the same cover mounted mech-
anism to be used with enclosures of varying depths or
with enclosures having the same depth in which circuit
breakers of more than one frame size are mounted.

Accordingly, a primary object of this invention is to
provide an operating mechanism operated externally of
an enclosure for control of a circuit breaker mounted
therein.

Another object is to provide a variable depth mech-
anism whereby the simple alternation of parts will enable
the same cover mounted control mechanism to be used
for enclosures of varying depths and with circuit breakers
of more than one frame size.

Still another object is to provide a means for aligning
the cover mounted mechanism and the extending mech-
anism which is in engagement with the circuit breaker
control handle.

Another object of the invention to provide a circuit
breaker housing having a cover which will be latched in
all positions of the circuit breaker handle.

Another object of the invention to provide a control
means for a circuit breaker comprising an exterior handle
on the housing which may be locked in "on" or "off" posi-
tions by means of a padlock or several padlocks.

A further object of the invention to provide a housing
for a circuit breaker unit having an exterior control handle
which can be operated to reset the circuit breaker unit
after it has opened, without opening the box or housing
to expose the unit.

A still further object of the invention to provide a hous-
ing and control means for a circuit breaker unit such

that the door or cover of the box will always be in latched condition except when the handle is moved to an extreme limit of arcuate motion.

Another object of the invention to provide means whereby the cover of the housing may be opened even though the handle be locked by one or more padlocks in the "on" position, that is, the latch may be defeated under certain circumstances.

A still further object of the invention to provide means whereby defeating of the latch is prevented when the exterior control handle on the cover is locked in the "off" position.

An even further and very important object of the invention to provide the exterior control handle on the cover with means for engaging the tang of the upper plate interiorly of the box so that the cover may be closed regardless of the relative positions of the cover or circuit breaker handles without causing damage or breakage to the tang or the circuit breaker unit control handle.

Other objects and features of my invention will be apparent from the following description when taken in conjunction with the appended drawings in which:

Figure 1 is a front view of the cover of the box showing the exterior control handle in relation to the indicia plate, a portion of the cover being broken away to show certain elements of the mechanism.

Figure 2 is a partial section through 2—2 of Figure 1.

Figure 3 is a partial section through 4—4 of Figure 1 with the enclosure cover partly open.

Figure 4 is a partial section through 4—4 of Figure 1 with the enclosure cover closed.

Figure 5 is an exploded view showing the general relationship of the several elements comprising the variable depth mechanism.

Referring to the figures, a molded case circuit breaker unit B is shown enclosed within a housing or box C and mounted to the back panel 175, the box having a door or lid D hinged thereto at hinges 174 in a conventional manner. The usual gasket may be provided for the cover D, the box being suitably fastened to a well as by the bracket F.

A description of the mechanism will now be given with particular reference to Figure 5 and as otherwise noted.

The invention as viewed on Figure 5 comprises a composition handle 10 integral with a shaft 12 molded thereto, the shaft passing through a bore 14 in a notched locking plate 15 fastened exteriorly on the cover or door D, and thence, through a bore 16 in the door D, and through a bore 18 in a mounting plate 20 fastened interiorly to the door. The elements 15 and 20 are secured to the door by means of bolts 22 passing through holes, such as 24, and having threaded engagement in aligned holes 28 in plate 15. Shaft 12 has a collar 30 surrounding it which is stationary and press fitted in bores 16 and 18.

Carried on the mounting plate 20 is a latch plate 35, having a latch hook 35a, which is pivoted to the mounting plate by the end 36 of a shaft 38 passing through a bore 40 and peened over at 42 as best seen in Figure 2 so as to grip the latch plate 35. Shaft 38 has an integral slotted button 38a. Latch hook 35a can engage the peripheral edge 151 of upper plate 105 to lock door D closed.

Plate 35 is provided with a cam surface 35b, for a purpose to be hereinafter described, the cam surface having a fairly steep contour.

A spring 50 surrounds collar 30 with sufficient radial clearance so that it can be wound at least a partial turn without binding on the collar. One end of the spring is suitably secured in a small bore 52 in the latch plate 35 while the other end bears in a hook-like recess 55 in an actuator plate 60. The plate 60 is provided with a rectangular slot 63 which keys the plate 60 to the rectangular end 66 of shaft 12. Threads 101 of bolt 100

and conventional washer assembly consisting of washers 72 and 75 are provided wherein bolt 100 fastens together shaft 12 and actuator plate 60 for integral rotation when handle 10 is rotated.

Plate 60 carries a control plate 80 having an opening 83 for accommodating tang 106 of upper plate 105. It is to be noted that the free end of tang 106 is blunt so as to minimize the possibility of injury to service personnel. The control plate 80 is resiliently mounted on plate 60 by means of two studs 90 which are fastened to plate 60 and pass through oversize holes 93 in plate 80, there being a spring 96 around each stud and held thereon by a clamp washer 100.

One of the studs 90 has a trip 90a which is engageable with cam edge 35b to effect rotation of plate 35 thereby to disengage hook 35a from edge 151. Thus, as viewed on Figure 5, clockwise rotation of plate 60, keyed to handle 10, serves to bring stud end 90a into engagement with the sharp rise 35b of the cam edge. This effects a quick unlatching clockwise rotation of plate 35 from the hook engaged condition shown. Figures 4 and 5, it being noted that due to the position and shape of cam edge 35b, only the last few degrees of rotation of handle 10 is effective to achieve rotation of plate 35 and unlatching of door D.

The springs 96 are provided with a suitable degree of initial compression, but permit plate 80 to rock with respect to plate 60 in the event door D is slammed shut when recess 83 is not aligned with tang 106. Thus, the door can be closed at any time without danger of breakage of tang 106 should it be struck by plate 80 since the plate can be rocked or tilted outwardly towards the door by tang 106. The handle 10 can thus be rotated with plate 80 in the tilted condition until tang 106 "finds" recess 83 at which time plate 80 snaps into proper operating position, as shown in Figure 1, the tang 106 then being encompassed by recess 83.

Thus, no matter what position handle 10 is in at the time the door is closed, no breakage of the tang 106 of the upper plate 105 can occur, because of the resilient mounting of plate 80 to tilt away from handle 87 until the recess 83 is aligned with it.

The head of bolt 100 is received by central hole 104 in upper plate 105. The upper ends of rods 107 are positioned in recesses surrounding holes 108 in upper plate 105 and are secured thereto by bolt and washer assemblies 109 or in any other suitable manner, while the lower ends of rods 107 are secured in a similar manner to lower plate 110 by means of bolts 112 which pass through clearance holes 111 in lower plate 110.

Lower plate 110 is pivotally mounted to shouldered pin 115. The body 114 of pin 115 has a slightly smaller diameter than hole 123 of lower plate 110 and the shoulder 116a of head 116 is slightly greater than 90°. Pin 115 is secured to mounting plate 119 by flat head screw 134 which passes through hole 118. A partially compressed coil spring 117 surrounds body 114 and bears against lower plate 110 and mounting plate 119 to bias the extending mechanism 200 comprising upper plate 105, lower plate 110, and rods 107 in an upward direction. Spring 117 serves as a resilient mounting for rigid extending mechanism 200 so that it may tilt between lines T—T should there be any misalignment between the cover operated mechanism 190 and the extending mechanism 200 when the cover D is closed.

The mounting plate 119 is shown mounted to the circuit breaker B by screws 121 which mate with tapped holes 122 but the mounting plate 119 may also be secured to the enclosure C. However, the mounting plate 119 must be positioned so that recess 113 in lower plate 110, similar to recess 83 in the control plate 80, surrounds the operating handle 87 of circuit breaker B.

As the cover D is pivoted from an open position (Figure 3) to the closed position (Figure 4) the narrow end 102a of the tapered portion 102 of bolt 100 enters hole

104 first. If the cover mounted mechanism 190 is in alignment with the extending mechanism 200 the cylindrical surface 103 will rest in hole 104 without moving the extending mechanism 200. But if mechanisms 190 and 200 are out of alignment when the door D is being closed, the conical section 102 will bear against the surface of the upper plate 105 surrounding hole 104 and force the extending mechanism 200 to tilt until the mechanisms 190 and 200 are in alignment and resiliently mounted latch member 35 has cammed itself so that latch tip 35a lies beneath latch surface 151. Pin 115 does not interfere with the tilting of extending mechanism 200 since body 114 is smaller than hole 123 and surface 116a of shoulder 116 is greater than 90°.

Accordingly, it will be understood that motion of handle 10 will serve to rotate, through shaft 12 and control plate 80, the extending mechanism 200, thus controlling handle 87 to "on" or "off" position, depending upon the position of the handle 10, it being understood that the size of the recess 113 is suitably designed so that the arcuate sides of the recess engage handle 87 on one side or the other thereof to compel motion past a dead center position and to effect full motion of handle 87 to either of its extreme limits, the lower limit being to "reset" position as shown on the indicia plate P.

In order to effect locking of the handle in either "on" or "off" position, there are provided a pair of notches 110 and 115 in plate 15 which are radially aligned with the respective "on" "off" indicia on the door D. These notches coact with a slidable locking pin 120 in handle 10 and having a forward edge 120a which can engage in either of the notches 110 and 115. Pin 120 is substantially of U shape so as to allow space for the fingers of an operator to fully grasp handle 10. The locking pin 120 is carried in a slot 122 molded in handle 10 and a spring 125 is carried in a slot in locking pin 120, slot 122 in handle 10 being widened to form a recess 126 to accommodate spring 125. Thus, the spring ends about the shoulders at the ends of the recess 126, and the spring being under initial compression biases pin 120 to outward position so that a tab 120c which is formed at the extreme forward end of the pin 120 normally protrudes outwardly of the end of handle 10, the outer edge of the handle being sufficiently slotted to permit tab 120c to protrude therethrough.

Accordingly, by manual pressure on tab 120c, pin 120 can be thrust to the left against the bias of spring 125 so that edge 120a may be inserted in either notch 110 or 115 of latch plate 28, depending on whether handle 10 is at the "on" or the "off" position, pin 120 being locked in notch 110 for the "on" position, or pin 120 may be radially aligned for locking in notch 115 for the "off" position.

Plate 15 is provided with shoulders 132 and 136, shoulder 132 being a wall of notch 110 while shoulder 136 is offset from 115. Shoulders 132 and 136 serve as stops to limit motion of handle 10 in either direction since pin 120 will engage shoulder 132 at the "on" position, and will engage shoulder 136 at the "reset" position. Pin 120 is then biased out of engagement with plate 15 by spring 125, as will be understood from the foregoing description, but edge 120a is always within the confines of the shoulders.

Handle 10, at its forward end, is provided with a sizable aperture 140, open at the bottom, to permit insertion of pin 120 during assembly. Aperture 140 is suitable to accommodate the hasp 143 of one or more padlocks 146 (Figure 5). Normally, the aperture 140, when pin 120 is biased outwardly, is blocked by the forward edge 143a of the pin 120; when, however, aperture 140 is cleared by rearward pushing of tab 120c, the padlock hasp 143 can be inserted in the aperture 140.

Accordingly, it will be seen that pin 120 can be utilized to lock in either notch 110 or 115, and with the padlock hasp in aperture 140, the pin is prevented from moving

outward since the portion comprising edge 143a of pin 120 is blocked by the hasp 143, thus, handle 10 is lockable in either the "on" or "off" position, but not in any other position.

Spring 50 lightly biases the handle 10 toward "on" position when the door D is open and handle 87 of the circuit breaker is not engaged in recess 83. Spring 50 also biases hook 35a toward latching engagement with ear 44; thus, as hereinabove described, rotating handle 10 to "reset" effects engagement of stud end 90a with cam rise 35b to release hook 35a from latch surface 151, the end 50a of spring 50 being wound to tighten the spring whence spring end 50b effects clockwise rotation of plate 35, reducing the diameter of the spring slightly, but not enough to bind on collar 30 owing to the initial radial spacing hereinabove mentioned.

In order to open door D, when pin 120 is locked in notch 110, the "on" position of handle 10, the shaft 38 is rotated clockwise (Figure 1) by a suitable screw driver tool inserted in the partially accessible slot of button 38a and rotated to rotate hook 35a out of engagement with latch surface 151.

Although spring 50 maintains plate 35 toward hook engaging position, as stated, when handle 10 is swung to "reset," stud end 90a engages the cam edge 35b to rotate plate 35 and thus unlock the door, full motion of the handle down to "reset" being required, a safety feature being thus effected.

In order to limit the arcuate motion of plate 35, the mounting plate 20 is provided with an ear 150 which is freely slidable in a slot 153 in plate 35. Thus, the arcuate travel of plate 35 is stopped by engagement of the edges of ear 150 with the respective ends of slot 153. Ear 150 has a tab 150a which overlaps the end of the slot to serve as a retainer for plate 35 so that it will not be bent away from the door by tension exerted by locking engagement with latch surface 151. The tab 150a is of suitable dimension to always overlap the end of the slot toward which it points or the surface of plate 35 at the side of the slot, so that it will provide sliding support for the plate at any rotated position thereof.

Plate 20 has an ear 156 bent therefrom, thus a corner of plate 80 overlays to a slight degree the corner of ear 156 when the handle 10 is in extreme downward or "reset" position. This prevents tilting of plate 80 toward the door at this time so that plate 80 will remain parallel thereto in the extreme downward position of handle 10.

In order to prevent defeating the latch 35a, and thereby opening of the door D when the handle is in the "off" position and locked by a padlock in that position, the handle 10 closely overlays button 38a so that access to the slot in the button cannot be had. Thus, a repairman working on the line will not be endangered by having current turned on since the door cannot be opened by defeating the latch provided, of course, one or more padlocks are used to ensure the handle remaining in the locked "off" position.

By virtue of the rotative mounting of plates 60 and 80 and extending mechanism 200, should the breaker open, the handle 87 thereof will snap downward carrying with it rotatively the extending mechanism 200 and plates 60 and 80 along with handle 10 to indicate "tripped" on and indicia plate P. Should the handle be padlocked at "on" position, it cannot move, but in such case plate 80 will tilt toward the door, being forced to do so by motion of the circuit breaker handle 87 so that the breaker will not be prevented from opening.

In order to reset the breaker after it has opened, it is merely necessary to move handle 10 to "reset" position and then upwardly to the "on" position.

It will thus be seen that door D is always latched closed by engagement of hook 35a with edge 151 unless such engagement is deliberately broken by rotation of button 38a. Further, button 38a is not accessible to defeat the latch when handle 10 is at "off" position. In addition,

resetting of the breaker is accomplished by handle 10 and there is no need to open door D for this purpose. However, the door can be opened, if desired, by moving handle 10 to the "reset" position. Finally, handle 10 may be locked in either the "on" or "off" positions by one or more padlocks without preventing opening of the breaker when padlocked in the "on" position.

As may readily be seen from the foregoing description, it is a simple matter to alter the extending mechanism 200 so that a single cover mounted mechanism 190 may be used with enclosures of varying depths regardless of the frame size of the circuit breaker mounted therein. That is, the only adjustment required is a mere cutting of the rods 107 to compensate for the spacing between the cover mounted mechanism 190 and the circuit breaker operating handle 87. Misalignment between the cover mounted mechanism 190 and the extending mechanism 200 is corrected by aligning means comprising the conical head 102 of bolt 100 and the hole 104 of upper plate 105 which tilts the resiliently mounted extending mechanism 200 with pin 115 as the center.

Having thus described my invention, I am aware that various changes may be made without departing from the spirit thereof. Accordingly, I do not seek to be limited to the precise embodiment illustrated herein except as set forth in the appending claims.

I claim:

1. An operating mechanism for a variable depth enclosure wherein a circuit breaker unit having a manual operating handle is mounted; said enclosure including a cover; said operating mechanism comprising a cover mounted mechanism and an extending mechanism; said cover mounted mechanism including a control handle carried on the exterior side of said cover for manual control of said operating handle; a first end of said extending mechanism being in operative engagement with said operating handle and a second end of said extending mechanism being operably engageable by said cover mounted mechanism when said cover is closed; said cover mounted mechanism including a control element carried at the interior side of said cover and actuable by said control handle; said second end including a first means; said control element including a second means alignable with said first means for engagement therewith and actuation of said extending mechanism; a resilient mounting means for said control element whereby said control element is depressible by said first means toward said cover in the event said cover is closed when said second means is misaligned with respect to said first means so as to prevent breakage thereof.

2. An operating mechanism for a variable depth enclosure wherein a circuit breaker unit having a manual operating handle is mounted; said enclosure including a cover; said operating mechanism comprising a cover mounted mechanism and an extending mechanism; said cover mounted mechanism including a control handle carried on the exterior side of said cover for manual control of said operating handle; a first end of said extending mechanism being in operative engagement with said operating handle and a second end of said extending mechanism being operably engageable by said cover mounted mechanism when said cover is closed; said cover mounted mechanism including a control element carried at the interior side of said cover and actuable by said control handle; said second end including a first means; said control element including a second means alignable with said first means for engagement therewith and actuation of said extending mechanism; a resilient mounting means for said control element whereby said control element is depressible by said first means toward said cover in the event said cover is closed when said second means is misaligned with respect to said first means so as to prevent breakage thereof; said first means comprising a tang; said control element comprising a plate;

said second means comprising an aperture in said plate having edges engageable with said tang.

3. An operating mechanism for a variable depth enclosure wherein a circuit breaker unit having a manual operating handle is mounted; said enclosure including a cover; said operating mechanism comprising a cover mounted mechanism and an extending mechanism; said cover mounted mechanism including a control handle carried on the exterior side of said cover for manual control of said operating handle; a first end of said extending mechanism being in operative engagement with said operating handle and a second end of said extending mechanism being operably engageable by said cover mounted mechanism when said cover is closed; said cover mounted mechanism including a control element carried at the interior side of said cover and actuable by said control handle; said second end including a first means; said control element including a second means alignable with said first means for engagement therewith and actuation of said extending mechanism; a resilient mounting means for said control element whereby said control element is depressible by said first means toward said cover in the event said cover is closed when said second means is misaligned with respect to said first means so as to prevent breakage thereof; said resilient mounting means comprising a support element carried by and keyed to said control handle; said control element being carried by said support element and being joined thereto by retaining means.

4. An operating mechanism for a variable depth enclosure wherein a circuit breaker unit having a manual operating handle is mounted; said enclosure including a cover; said operating mechanism comprising a cover mounted mechanism and an extending mechanism; said cover mounted mechanism including a control handle carried on the exterior side of said cover for manual control of said operating handle; a first end of said extending mechanism being in operative engagement with said operating handle and a second end of said extending mechanism being operably engageable by said cover mounted mechanism when said cover is closed; said cover mounted mechanism including a control element carried at the interior side of said cover and actuable by said control handle; said second end including a first means; said control element including a second means alignable with said first means for engagement therewith and actuation of said extending mechanism; a resilient mounting means for said control element whereby said control element is depressible by said first means toward said cover in the event said cover is closed when said second means is misaligned with respect to said first means so as to prevent breakage thereof; said first means comprising a tang; said control element comprising a plate; said second means comprising an aperture in said plate having edges engageable with said tang; said resilient mounting means comprising a support element carried by and keyed to said control handle; said control element being carried by said support element and being jointed thereto by retaining means comprising flexible elements.

5. An operating mechanism for a variable depth enclosure wherein a circuit breaker unit having a manual operating handle is mounted; said enclosure including a cover; said operating mechanism comprising a cover mounted mechanism and an extending mechanism; said cover mounted mechanism including a control handle carried on the exterior side of said cover for manual control of said operating handle; a first end of said extending mechanism being in operative engagement with said operating handle and a second end of said extending mechanism being operably engageable by said cover mounted mechanism when said cover is closed; said cover mounted mechanism including a control element carried at the interior side of said cover and actuable by said control handle; said second end including a first means; said control element including a second means alignable

with said first means for engagement therewith and actuation of said extending mechanism; a resilient mounting means for said control element whereby said control element is depressible by said first means toward said cover in the event said cover is closed when said second means is misaligned with respect to said first means so as to prevent breakage thereof; said first means comprising a tang; said control element comprising a plate; said second means comprising an aperture in said plate having edges engageable with said tang; said resilient mounting means comprising a support element carried by and keyed to said control handle; said control element being carried by said support element and being joined thereto by retaining means; said retaining means comprising stud members intermediate said support and control elements and spring means compressively disposed between said control and support elements, one of said latter elements being loosely retained by said stud members.

6. An operating mechanism for a variable depth enclosure wherein a circuit breaker unit having a manual operating handle is mounted; said enclosure including a cover; said operating mechanism comprising a cover mounted mechanism and an extending mechanism; said cover mounted mechanism including a control handle carried on the exterior side of said cover for manual control of said operating handle; said extending mechanism comprising an upper plate, a lower plate, at least one connecting rod disposed between said upper and lower plates and secured thereto; said lower plate including an aperture; said operating handle being positioned within said aperture; said lower plate having a circular hole therein; a rigidly mounted pin including a cylindrical body having a shoulder at one end thereof; said body having an outside diameter smaller than the diameter of said hole; said body being entered into said hole; a partly compressed spring means positioned to urge said lower plate into engagement with said shoulder and to bias said extending mechanism toward the closed position of said cover; said upper plate including a first means; said cover mounted mechanism including a second means carried at the interior side of said cover; said second means engageable with said first means when said cover is closed thereby tilting said extending mechanism and compensating for misalignment between the extending and cover mounted mechanism; said cover mounted mechanism including a control plate carried at the interior side of said cover and actuable by said control handle; said upper plate having a tang extending therefrom in the direction of the closed cover position; said control plate including an aperture having edges engageable with said tang; a resilient mounting means for said control plate whereby said control plate is depressible by said tang toward said cover in the event said cover is closed when said control plate aperture is misaligned with respect to said tang so as to prevent breakage thereof.

7. An operating mechanism for a variable depth enclosure wherein a circuit breaker unit having a manual operating handle is mounted; said enclosure including a cover; said operating mechanism comprising a cover mounted mechanism and an extending mechanism; said cover mounted mechanism including a control handle carried on the exterior side of said cover for manual control of said operating handle; said extending mechanism comprising an upper plate, a lower plate, at least one connecting rod disposed between said upper and lower plates and secured thereto; said lower plate including an aperture; said operating handle being positioned

within said aperture; said extending mechanism being rotatably mounted within said enclosure; said upper plate being operatively engageable by said cover mounted mechanism when said cover is closed by means of the reception of a blunt tang by a cooperating aperture; said blunt tang extending from one, and said cooperating aperture being formed in the other, of said cover mounted mechanism and said upper plate.

8. An operating mechanism for a variable depth enclosure wherein a circuit breaker unit having a manual operating handle is mounted; said enclosure including a cover; said operating mechanism comprising a cover mounted mechanism and an extending mechanism; said cover mounted mechanism including a control handle carried on the exterior side of said cover for manual control of said operating handle; said extending mechanism comprising an upper plate, a lower plate, at least one connecting rod disposed between said upper and lower plates and secured thereto; said lower plate including an aperture; said operating handle being positioned within said aperture; said extending mechanism being rotatably mounted within said enclosure; said upper plate being operatively engageable by said cover mounted mechanism when said cover is closed by means of the reception of a blunt tang by a cooperating aperture; said blunt tang extending from one, and said cooperating aperture being formed in the other, of said cover mounted mechanism and said upper plate; said cover mounted mechanism including a resiliently mounted portion engageable with said extending mechanism whereby damage to both of said mechanisms is prevented even if said blunt tang is not received by said cooperating aperture upon the closing of said cover.

9. An operating mechanism for a variable depth enclosure wherein a circuit breaker unit having a manual operating handle is mounted; said enclosure including a cover; said operating mechanism comprising a cover mounted mechanism and an extending mechanism; said cover mounted mechanism including a control handle carried on the exterior side of said cover for manual control of said operating handle; said extending mechanism comprising an upper plate, a lower plate, at least one connecting rod disposed between said upper and lower plates and secured thereto; said lower plate including an aperture; said operating handle being positioned within said aperture; said extending mechanism being rotatably mounted within said enclosure; said upper plate being operatively engageable by said cover mounted mechanism when said cover is closed by means of the reception of a blunt tang by a cooperating aperture; said blunt tang extending from said upper plate and being positioned within the confines of said enclosure; said cooperating aperture being formed in said cover mounted mechanism; said control handle being pivotable about a first axis; said cooperating aperture being positioned to pivot about said first axis while being positioned out of axial alignment therewith.

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