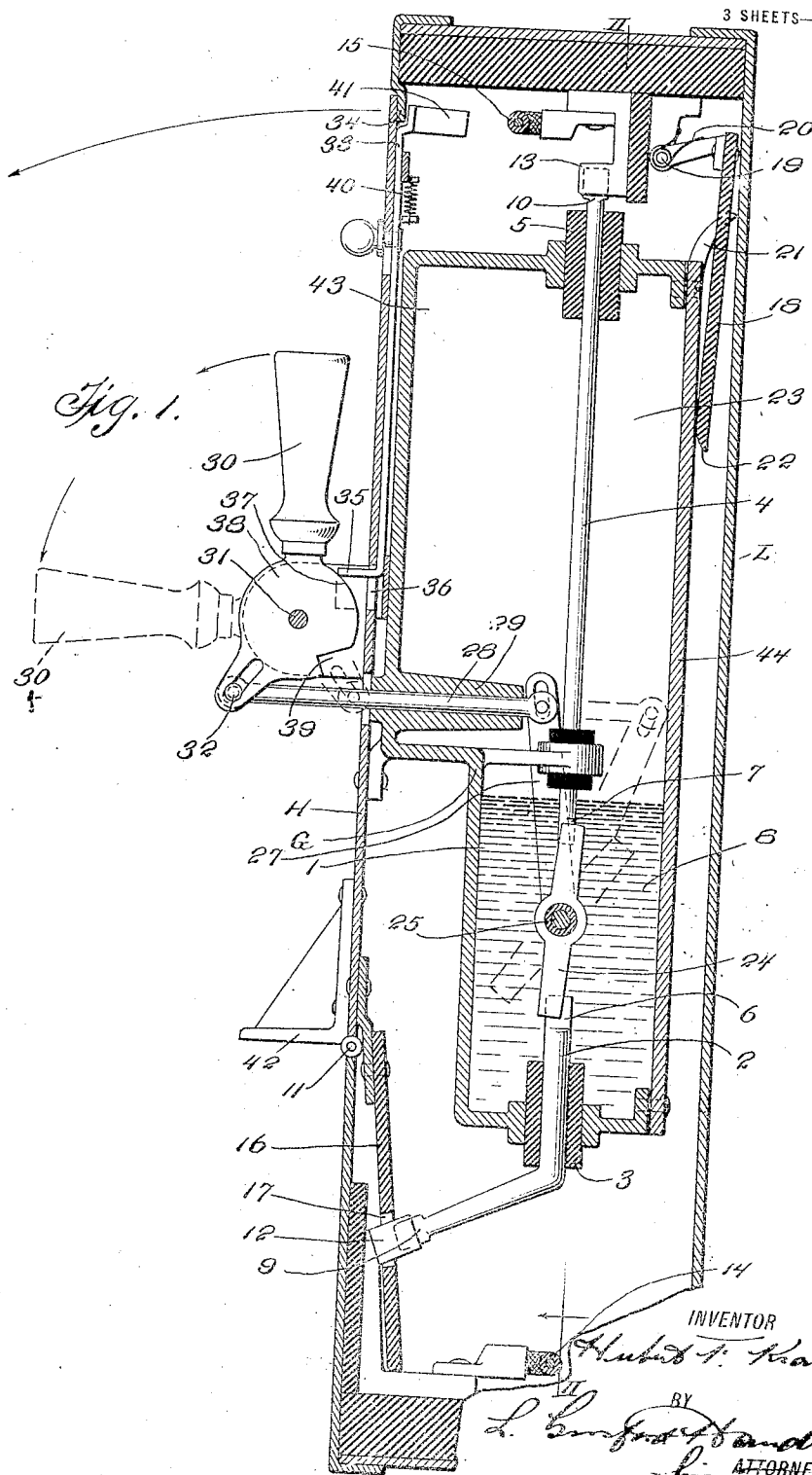


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H. F. KRANTZ.
OIL SWITCH BOX.
APPLICATION FILED JUNE 16, 1917.

Patented Dec. 16, 1919.

3 SHEETS—SHEET 1.



INVENTOR

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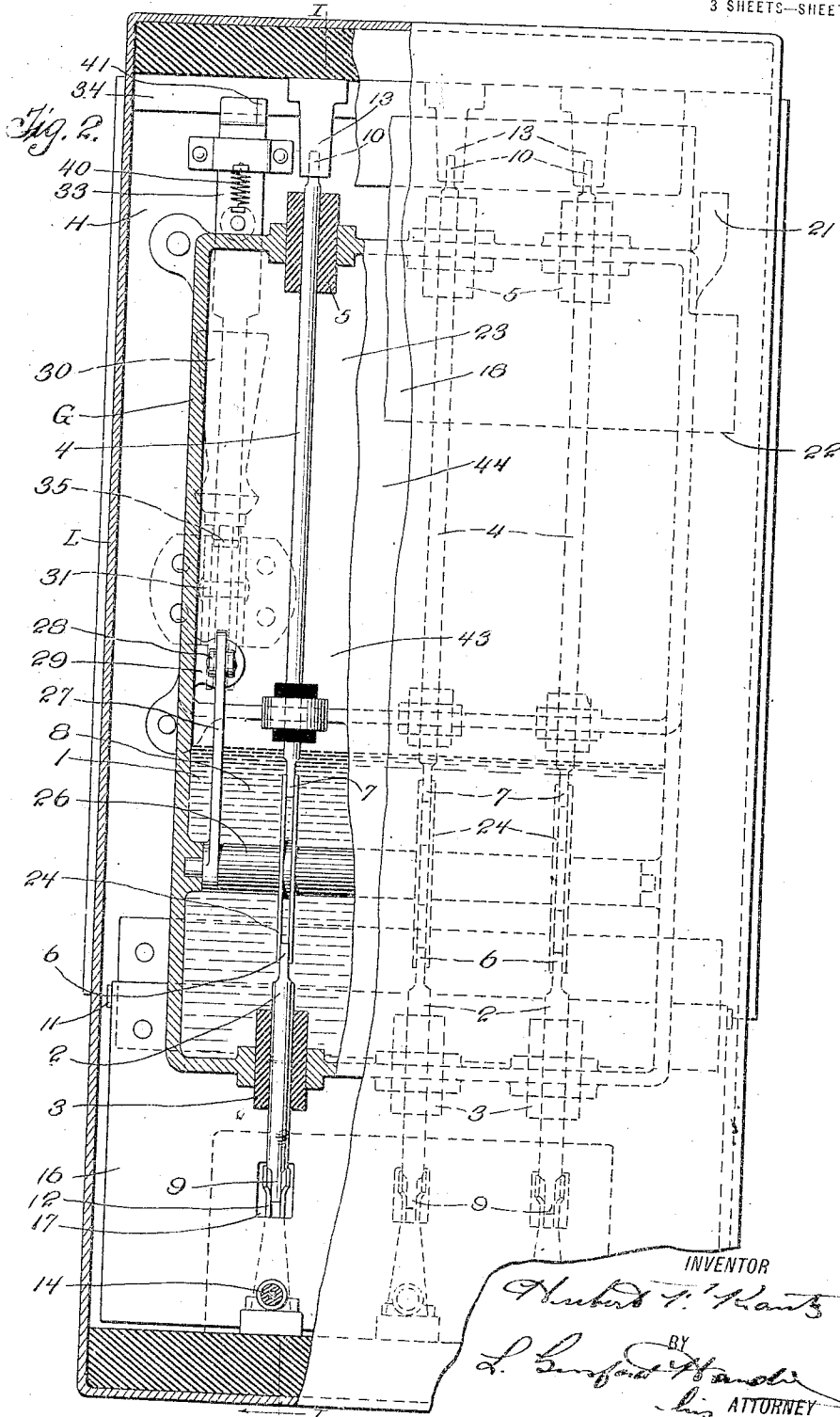
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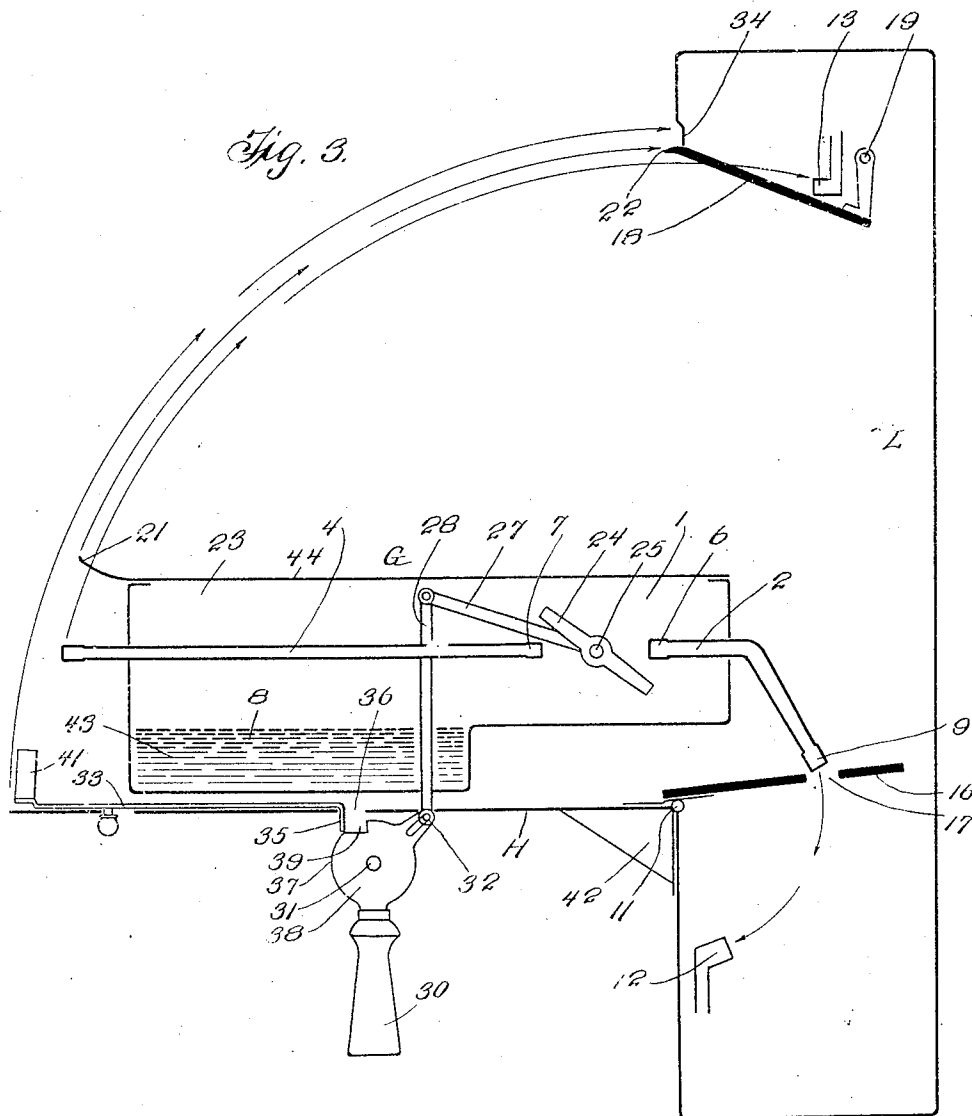
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INVENTOR
Hubert F. Krantz
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UNITED STATES PATENT OFFICE.

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OIL-SWITCH BOX.

1,324,909.

Specification of Letters Patent.

Patented Dec. 16, 1919.

Application filed June 16, 1917. Serial No. 175,195.

To all whom it may concern:

Be it known that I, HUBERT F. KRANTZ, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Oil-Switch Boxes, of which the following is a specification.

This invention relates to an oil switch.

A particular object of the invention is to provide an oil switch of a character such that oil contained therein may be readily displaced, without likelihood of loss, for the purpose of inspecting and repairing any of the moving parts of the mechanism.

A further object is to provide an oil switch which is particularly adapted for use in connection with safety panel boxes and the like.

A further object is to provide a switch mechanism pivoted to swing into and out of operative position, and which, when out of operative position, may be swung into a substantially horizontal, or table-like, position for ready inspection and repair.

A further object is to provide a switch mechanism, in association with a safety panel box, pivotally mounted so as to swing rigid contact portions of the switch mechanism into and out of electrical connection with contact parts fixed within the box, and said switch mechanism including a switch blade operable to control the electrical connection between said rigid contacts, together with means for insuring an "off" position of the switch blade when said rigid contact parts are swung.

A further and more detailed object is to provide a switch mechanism mounted upon the inner side of a safety panel box door which is pivoted to swing downwardly from a vertical to a horizontal position, and to provide desirable electrical connections for the switch mechanism.

A further object is to provide suitable barriers or guard members operable for guarding live contacts of the device when the door is open.

Other objects and aims of the invention, more or less specific than those referred to above, will be in part obvious and in part pointed out in the course of the following description of the elements, combinations, arrangements of parts and applications of principles, constituting the invention; and

the scope of protection contemplated will be indicated in the appended claims.

In the accompanying drawings which are to be taken as a part of this specification, and in which I have shown merely a preferred form of embodiment of the invention:

Figure 1 is a vertical sectional view through a switch mechanism and safety panel box constructed in accordance with this invention the section being taken substantially upon the plane of line I of Fig. 2.

Fig. 2 is a vertical sectional view taken substantially upon the plane of line II of Fig. 1, looking in the direction of the arrow, and parts of the rear of the device being shown in elevation, and

Fig. 3 is a diagrammatic illustration showing the relation of all of the parts when the door is open.

Referring to the drawings for describing in detail the structure which is illustrated therein, the reference character L indicates the panel box generally. This may be made up of any suitable material, either sheet metal or otherwise, according to preference. In the drawing it is shown to be made of sheet metal.

The oil switch mechanism is indicated generally by the reference character G. It consists of a casing having a pocket or reservoir 1 in its lower portion for containing the oil. A conductor 2 extends upwardly through the bottom wall, being suitably insulated as at 3, and a conductor 4 extends downwardly through the top wall, being suitably insulated as at 5. The conductors 2 and 4 are substantially in axial alinement and terminate in spaced contact portions 6 and 7 within the pocket 1 so that said contact portions are entirely beneath the oil which is contained within said pocket.

Exteriorly of the lower wall of the pocket the conductor 2 terminates in a contact member 9, while the conductor 4 terminates in a contact member 10 above the upper wall of the casing.

The contact members 9 and 10 constitute the parts above referred to as rigid contact parts of the switch mechanism.

The switch mechanism is supported upon the door H of the box which is hinged upon a horizontal axis as at 11 and when the door swings the contacts 9 and 10 move with it.

into and out of electrical connection with co-operative contacts 12 and 13 fixed within the panel box, as is clearly seen from inspection of Fig. 3.

5 The contacts 12 and 13 are connected with main and branch line conductors 14 and 15 in any suitable manner.

A guard member 16 is fixed to the door adjacent the hinge in such manner as to interpose itself above the contact 12 when the door is open, so as to prevent likelihood of an operator accidentally coming into engagement with said contact 12. A suitable opening 17 is provided to enable the contact 12 to be reached by the contact 9 when the door is closed.

A guard member 18 for the contact 13 at the upper end of the box is pivoted upon a suitable bracket as at 19 and is spring pressed, as by a spring 20 toward a position beneath the contact 13, that is the position shown in Fig. 3. In order to move this guard member down and away from the contact 13 when the door is swung toward closed position the door is preferably provided with a finger 21 for engaging the edge 22 to cause the guard member to swing downwardly and assume a position clear of the contact 13 when the door is fully closed as shown in Fig. 1. The finger 21 may be mounted directly upon the door or it may be connected with the casing G of the switch mechanism as shown, as desired.

The barriers or guard members 16 and 18 illustrated may readily be displaced by other forms of guard members if desired. They are illustrated only as an example of guard members which are under the control of the moving door for protecting an operator against accidentally engaging with any of the live parts.

It should be here stated that any suitable auxiliary devices, such for instance as transformers and the like, or fuses may be contained within the spaces protected by the guard members or they may even be contained within the open space 23 within the upper portion of the casing G, or otherwise arranged, as desired.

50 A switch blade 24 is pivotally mounted upon a shaft 25 arranged within the pocket 1 between the contact portions 6 and 7 of the conductors 2 and 4 so as to be wholly beneath the oil in said pocket. There may be as many of the blades 24 as desired along the length of the shaft 25, one for each set of conductors 2 and 4 present as disclosed particularly in Fig. 2. Each set of conductors has its respective rigid contact portions 9 and 10 and appropriate contacts for connection with main and branch lines.

The switch blades are insulated from the shaft and from each other by suitable insulating material 26 also carried by the shaft.

An arm 27 is rigidly connected at one end of the shaft and projects upwardly above the level of the oil and has slot connection with a rod 28 slidably mounted in a bearing 29 formed in the casing. An operating handle 30 is pivotally mounted as at 31 exteriorly of the panel box and has slot connection as at 32 with the outer end of the shaft 28 whereby when the operating handle is moved from a vertical position as shown by full lines in Fig. 1 to a horizontal position as shown by the dotted lines in said figure, the rod 28 will be slid inwardly and the switch blade will be moved from an "on" to an "off" position.

Any suitable means may be employed for retaining the door of the panel box against being opened while the switch blades are in the "on" position. For this purpose the drawings illustrate a latch bar 33 which is slidably mounted on the inner surface of the door H. The upper end of this bar is off-set to engage behind a portion 34 of the panel box when in locking position. The lower end of the bar is provided with an extension 35 which projects through an opening 36 in the door and stands in position to engage a concentric surface portion 37 of a plate 38 connected with the handle 30. So long as the handle is in a position with the surface 37 beneath the part 35 the latch bar is positively held against movement out of locking position. The plate 38 is however, provided with a notch 39 therein arranged so as to stand in position to receive the extension 35 when the handle is thrown into the "off" position, as in Fig. 3. Thus the handle 30 must be in the "off" position, and the switch blades 24 consequently also in the "off" position, before it is possible to swing the door open. The chances of a destructive arc at either of the fixed contacts 12 and 13 are thus positively avoided.

A suitable tension spring 40 may be connected with the latch bar to urge it normally toward locking position if desired.

The latch bar 33 may be provided with an extension 41 at its upper end for limiting the closing movement of the door except when the handle 30 is in the "off" position and the latch bar is lowered.

Whenever it is necessary to inspect the switch mechanism, or particularly the parts within the casing G, the door may be swung open, that is from the vertical position of Fig. 1 to the horizontal position of Fig. 3, and brought to rest upon a stop bracket 42 so that the mechanism may be readily inspected or repaired, while in this convenient table-like position.

The shape of the casing G is such that when in the horizontal position it provides a pocket or reservoir 43 independent of the pocket 1 into which the oil in said pocket

1 freely flows as the door was swung downwardly, leaving the pocket 1 substantially empty of oil and all of the moving contacts and other parts therein, as well as any auxiliary mechanism contained with the casing, free for inspection and repairs by the simple removal of a cover plate 44 which forms a part of said casing, and which is then in a horizontal position so that it may be easily and conveniently removed without danger or likelihood of wasting any of the oil. All of the parts swung out with the door, are entirely free of engagement with any live parts and may be handled without danger to the operator.

As many changes could be made in this construction without departing from the scope of the invention as defined in the following claims, it is intended that all matter contained in the above description or shown in the accompanying drawings, shall be interpreted as illustrative only and not in a limiting sense.

It should be pointed out that while the cover plate 44 controls an opening into the casing G which opening is beneath the level of the oil when the casing is in its vertical or operative position, yet this cover plate is positively concealed and protected by the walls of the panel box and therefore cannot be removed or molested so long as the casing G stands in its operative position. It can only be removed after the casing G has been swung downwardly and the oil therefore displaced from adjacent the opening.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

1. In an oil switch, an oil reservoir having switch mechanism therein, means whereby the reservoir may be moved to displace the oil therefrom, and an auxiliary reservoir integral therewith to receive the oil from the first reservoir.

2. In an oil switch, an oil reservoir having switch mechanism therein, a pivotal support for the reservoir whereby the reservoir may be tilted to displace the oil therefrom, and an auxiliary reservoir carried thereby to receive the oil from the first reservoir.

3. In an oil switch, an oil reservoir having switch mechanism therein, a pivotal support for the reservoir whereby the reservoir may be tilted to displace the oil therefrom, means for limiting the pivotal movement of the reservoir, and an auxiliary reservoir carried thereby and adapted to receive and contain the oil from the first reservoir when said first reservoir is fully swung and said limiting means is effective.

4. An oil switch comprising an oil container having switch mechanism therein, the container being movable from an operative inaccessible position to an inoperative position of accessibility, the container

having a part adapted to contain the oil in a position submerging the switch mechanism when the container is in its inaccessible position, and the container further having a part to contain the oil free of the switch mechanism when the container is in its accessible position.

5. An oil switch comprising an oil container which is movable into two positions to alter the position of the oil therein, the container having an opening from one wall thereof disposed to stand beneath the oil level when the container is in one of its positions and to stand above the oil level when the container is in its other position, a closure for said opening, and means adapted to prevent removal of said closure while the container is in a position with said opening beneath the oil level.

6. In an oil switch, a container, a casing therefor having a door upon which the container is mounted to swing into and out of the casing, the container having switch mechanism therein disposed to stand beneath the level of the oil within the container when the door is closed, the container having a pocket therein to receive the oil out of submerging relation with said switch mechanism when the door is open, terminal contacts for said mechanism arranged exteriorly of the container and movable therewith, stationary contacts within the casing into and out of engagement with which said terminals move when the door is swung, and means connected to be operated by the movements of the door for interposing a barrier for one of said stationary contacts when the door is swung open.

7. A switch comprising a switch mechanism, and an oil-containing receptacle therefore, said receptacle being of such shape that when it is in one position the switch mechanism is immersed in the oil and when it is in another position the oil is in a position free from the switch mechanism.

8. In an oil switch, an oil reservoir movable into two positions, switch mechanism therein, and said reservoir being shaped to provide two localities each adapted to contain oil in accordance with the position of the reservoir.

9. A switch comprising a switch mechanism, an oil-containing receptacle therefore, and means for supporting the receptacle in two positions, said receptacle being of such shape that when it is in one position the switch mechanism is immersed in the oil and when in the other position the switch mechanism is free from the oil.

10. A switch comprising a switch mechanism, an oil-containing receptacle therefore, means for supporting the receptacle in two positions, said receptacle being of a shape such that when in one position the switch

mechanism is immersed in the oil and when in the other position the switch mechanism is free from the oil, and said receptacle including a removable cover removable to give access to the switch mechanism.

11. A switch comprising a switch mechanism, an oil-containing receptacle therefor, and means for supporting the receptacle in a vertical and horizontal position, said receptacle being of such shape that when it is in its vertical position the switch mechanism is immersed in the oil and when in its horizontal position the switch mechanism is free from the oil.

12. A switch comprising a switch mechanism, an oil-containing receptacle therefor movable into two positions and having an opening thereinto beneath the level of the oil when the receptacle is in one position, a removable cover for the opening, a support for the receptacle adapted to render the cover inaccessible when the receptacle is in one of its positions, and said receptacle being of such shape that when it is moved to its other position the cover is accessible and the switch mechanism and cover are free from the oil.

13. A switch comprising a switch mechanism, an oil-containing receptacle therefor, means for supporting the receptacle in two positions, said receptacle being of a shape such that when in one position the switch mechanism is immersed in the oil, and when in the other position the switch mechanism is free from the oil, and said receptacle including a removable cover removable to give access to the switch mechanism, together with means whereby to prevent removal of the cover while the receptacle is in one of its positions.

14. A switch comprising a switch mechanism, an oil-containing receptacle therefor and means for moving the receptacle into and out of its operative position, said receptacle being of such shape that when moved to its operative position the mechanism is immersed in the oil and when moved to its inoperative position, the mechanism is free from the oil.

15. A switch comprising a switch mechanism having conductors extending therefrom, a receptacle therefor, terminal members exteriorly to the receptacle for engaging the conductors extending from the switch mechanism, means for actuating the switch mechanism to control the electrical connection between said conductors, means for moving the receptacle to effect disengagement between the conductors and the exterior terminal members, means for insuring electrical disconnection of the conductors within the receptacle prior to the movement of the receptacle, and barriers for rendering inaccessible the terminal members when the receptacle is moved.

16. In an oil switch, a casing, switch mechanism within the casing, means whereby manually to operate said switch mechanism into "on" and "off" positions from without the casing, and the casing being shaped to provide two oil reservoirs therein one adapted to retain oil in a position for submerging said switch mechanism and the other disposed for receiving the oil when it is desired to free the switch mechanism of the oil.

17. An oil switch comprising an oil container which is movable into two positions to alter the position of the oil therein, and switch mechanism arranged within the container, said switch mechanism being disposed in a position to stand beneath the oil level when the container is in one of its positions and to stand above the oil level when the container is in its other position.

18. An oil switch comprising an oil container which is movable into two positions to alter the position of the oil therein, and switch mechanism arranged within the container, said switch mechanism being disposed in a position to stand beneath the oil level when the container is in one of its positions and to stand above the oil level when the container is in its other position, together with means comprising a part of the container displaceable to give access to the switch mechanism when the container is in position with the switch mechanism above the oil level.

19. A switch comprising a container, a pair of conductors extending into the container having terminals exteriorly of the container, a switch within the container operable to control electrical connection between said conductors, switch operating means, contacts arranged exteriorly of the container engaged by said terminals, the container being movable to disengage the terminals from said contacts, and means requiring operation of the switch operating means into "off" position prior to any movement of the container for disengaging the terminals of said contacts.

20. A switch mechanism comprising a casing having a door pivotally mounted to give entrance therinto, a switch device arranged within the casing being carried by the door to swing therewith, stationary terminals of opposite polarity arranged within the casing, the switch device comprising a pair of contacts movable into and out of engagement with said stationary terminals by closing and opening movement respectively of the door, said switch device also including a switch blade operable to control electrical connection between said contacts, means to operate said switch blade from without the casing, and means insuring "off" position of said switch blade prior to opening of the door.

21. A switch mechanism comprising a casing having a door pivotally mounted to give entrance therinto, a switch device arranged within the casing being carried by the door to swing therewith, stationary terminals of opposite polarity arranged within the casing, the switch device comprising a pair of contacts movable into and out of engagement with said stationary terminals by closing and opening movement respectively of the door, said switch device also including a conductor member operable to control electrical connection between said contacts, and barriers operable by swinging of the door to render inaccessible the stationary terminals when the door is swung open. 15

In testimony whereof I affix my signature in the presence of two witnesses.

HUBERT F. KRANTZ.

Witnesses:

JOHN L. KOLLE,
FRITZ KREUTZMANN.