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PLUG AND SWITCH BOX

Original Filed July 2, 1943

Fig.1

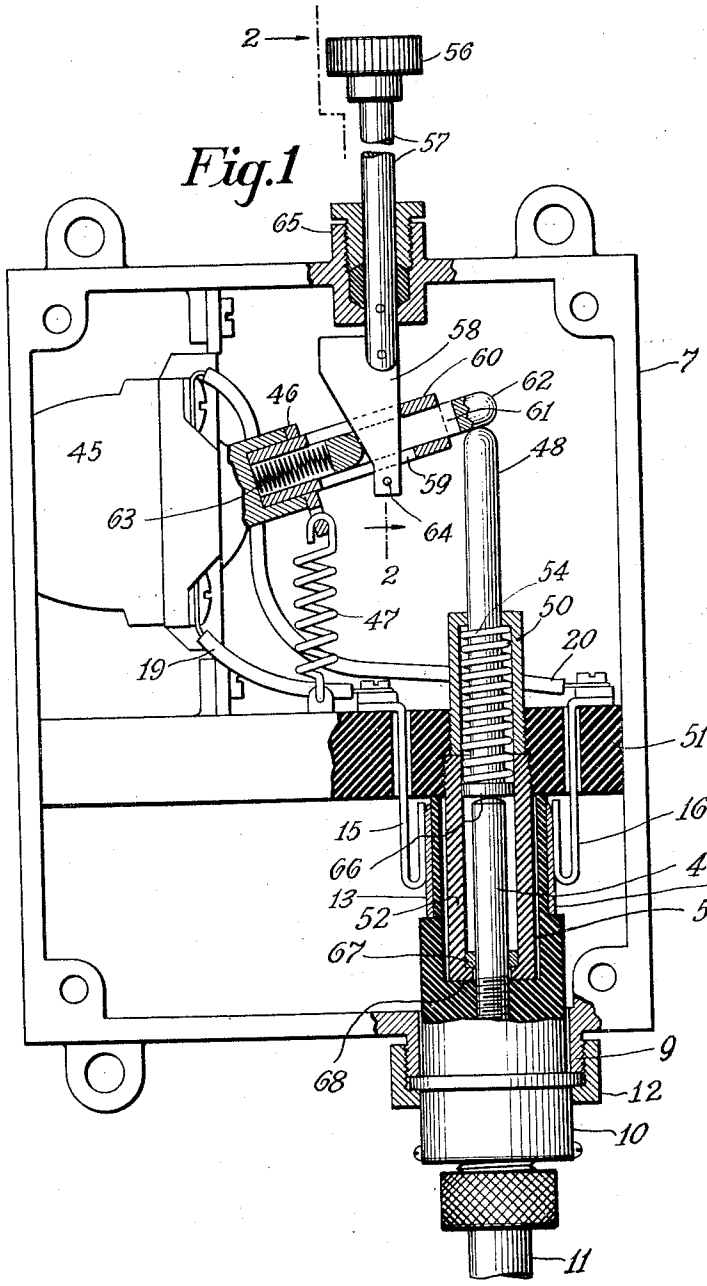
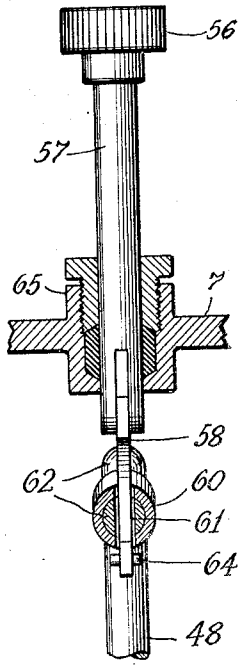


Fig.2



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PLUG AND SWITCH BOX

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Original application July 2, 1943, Serial No. 493,313. Divided and this application March 16, 1946, Serial No. 654,957

2 Claims. (Cl. 200—50)

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The invention herein disclosed relates to apparatus for providing water-tight extension circuits on shipboard and is a division of the invention covered in copending patent application Serial No. 493,313, filed July 2, 1943, now Patent No. 2,397,595.

Objects of the invention are to provide a water-tight form of outlet box and plug construction which will be so protected that the plug carrying the extension circuit cannot be withdrawn without turning the current off at the box and in which the current will not be turned on at the box until the plug is positioned therein.

Another important object of the invention is to enable the current to the extension circuit being turned off without withdrawing the plug from the box.

Further objects of the invention are to provide a safe and reliable quick acting form of water-tight receptacle and plug combination having the foregoing advantages, which will be of simple and inexpensive construction and practical in every way.

Other desirable objects and the novel features by which the purposes of the invention are attained are set forth or will appear in the course of the following specification.

The drawing accompanying and forming part of the specification illustrates a present commercial embodiment of the invention but it is to be appreciated that structure may be modified and changed as regards such illustration, all within the true intent and broad scope of the invention as hereinafter defined and claimed.

Fig. 1 in the drawing is a broken sectional view showing the plug in position in the box and the switch in the circuit closed position;

Fig. 2 is a broken sectional detail as on substantially the plane of line 2—2 of Fig. 1.

The box structure comprises a box body 7 constructed for mounting on a wall, ceiling, deck or other support, provided with a water-tight cover (not shown) and having a flanged opening at 9 in the bottom, for the plug 10 of the extension circuit cable 11.

The plug is shown as carrying side contacts 13, 14, engageable with receptacle contacts 15, 16, within the box.

Circuit to the receptacle contacts is controlled by a toggle switch 45 connected by conductors 19, 20, with the respective receptacle contacts 15, 16.

Actuation of the switch in the circuit closing direction is effected by and under control of the plug.

The actuating rocker 46 of the toggle switch

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is shown biased in the circuit opening direction by a spring 47 and as operated in the circuit closing direction by a plunger 48 adapted to be projected by a key pin 49 in the end of the plug.

The plunger 48 is shown as operating in a tubular guide 50 extending through the receptacle base 51 which serves as a cross partition in the box, and this guide is shown as having attached to or extending from it a guard sleeve 52 which may be of insulating material.

The plug is formed with an end cavity 53 to freely receive the guard tube 52.

A spring 54 within the guide 50 serves to hold the plunger 48 in retracted relation, with the switch retained in open circuit condition by spring 47 when there is no plug in the box.

When the special plug designed for the box is inserted, as shown in Fig. 1, the plunger 48 will be projected by the center pin 49 of the plug and thereby caused to rock the switch into the circuit closed position for extending current to the receptacle contacts 15, 16. In this condition the plug contacts 13, 14, are in circuit but the plug is free to be removed at any time and when it is removed it permits the switch to swing to the open circuit condition under impulse of spring 47, thus to deenergize the receptacle contacts 15, 16.

To enable control of the extension plug circuit while the plug is in place, the box is provided with an exposed push-button 56 on a plunger 57 projecting up through the top of the box and carrying inside the box a cam 58 sliding through a slot 59 in the tubular portion 60 of the switch handle and through a slot 61 in the plunger portion 62 of that handle, to thrust back the latter clear of the operating plunger 48.

The plunger portion 62 of the toggle lever is shown as pressed outward in the tubular part 60 by spring 63 so as to normally overstand the end of plunger 48 and be engaged thereby to close the switch when the plug is inserted, but at any time after that, the push-button may be operated to telescope the projected portion of the switch handle inwardly free of the plunger, whereupon the spring 47 will snap the switch to open circuit condition and thus cut off the receptacle contacts. Then, if it be desired to close the plug circuit, the push-button plunger 57 may be pulled outward, whereupon the cross pin 64 in the lower end of the wedge cam 58 will engage the tubular switch handle to swing the switch back to the closed circuit position.

The spring 63 is strong enough to hold the slid-

ing portion 62 of the switch handle pushed outward against the cam when the plug is inserted, thus to automatically project the push-button into position where it may be utilized for interrupting the plug circuit, and spring 47 is strong enough to pull the switch to open circuit position whenever the plug is removed.

The push-button plunger is shown operating through a water-tight gland 65 and similar water-tight connections may be provided where the switch actuating plunger 48 operates through the insulating partition 51.

The guide tube 50 and guard tube 52 may be screwed into opposite sides of the insulating base 51, as indicated, to facilitate ready removal and replacement. The plunger 48 may be a Bakelite rod or other insulating material.

To make a water-tight joint when the plug is removed from the box, the head 66 of the switch actuating plunger 48 may carry or may engage a gasket 67 on the flange 68 in the lower end of the guard tube 52.

The invention makes it certain that the receptacle contacts will be out of circuit when there is no plug in the box. Inserting the plug in the box operates the toggle switch to cut the receptacle contacts into circuit and thus carry current to the plug extension circuit. The operation of inserting the plug in the box also projects the control plunger 56, 57, putting that into position where it may be operated at any time to telescope the toggle plunger and permit the switch to be snapped by spring 47 to "off" position. The control plunger 56, 57, also may be pulled out at any time to snap the toggle switch to the "on" position to energize the receptacle contacts 15, 16.

What is claimed is:

1. A combined plug and switch box, comprising a water-tight box having a plug opening, a plug receptacle in the box in line with said opening, a plug for engagement in said receptacle, a plunger in said box in line with the movement of plug entry, a guard about said plunger, said plug having an opening in the end of the same to receive said guard and provided with a pin within said opening positioned to engage and actuate the plunger, a switch mounted in the box and connected to control said plug receptacle, said switch having an actuating toggle in line with said plunger to be thereby engaged and operated by said plunger upon insertion of a plug within the box and spring means for throwing said switch toggle to "off" position when no plug is in place in the box, said toggle having a retractable portion movable to a position clear of the operating plunger and means exteriorly of the box for effecting said retractable movement of said retractable portion of the toggle.

2. A combined plug and switch box, comprising a water-tight box having a plug opening, a plug receptacle in the box in line with said opening, a plug for engagement in said receptacle, a plunger in said box in line with the movement of plug entry, a guard about said plunger, said plug having an opening in the end of the same to receive said guard and provided with a pin within said opening positioned to engage and actuate the plunger, a switch mounted in the box and connected to control said plug receptacle, said switch having an actuating toggle in line with said plunger to be thereby engaged and operated by said plunger upon insertion of a plug within the box, spring means for throwing said switch toggle to "off" position when no plug is in place in the box, said toggle having a retractable portion movable to a position clear of the operating plunger, means exteriorly of the box for effecting said retractable movement of said retractable portion of the toggle, said latter means including a plunger movable in one direction to free said toggle of the operating plunger and movable in the opposite direction to shift said toggle to the closed circuit position of the switch.

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