Aug. 11, 1931. W. A. WULLE 1,818,290

COMBINED SWITCH AND TERMINAL BLOCK

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Fig. 1.

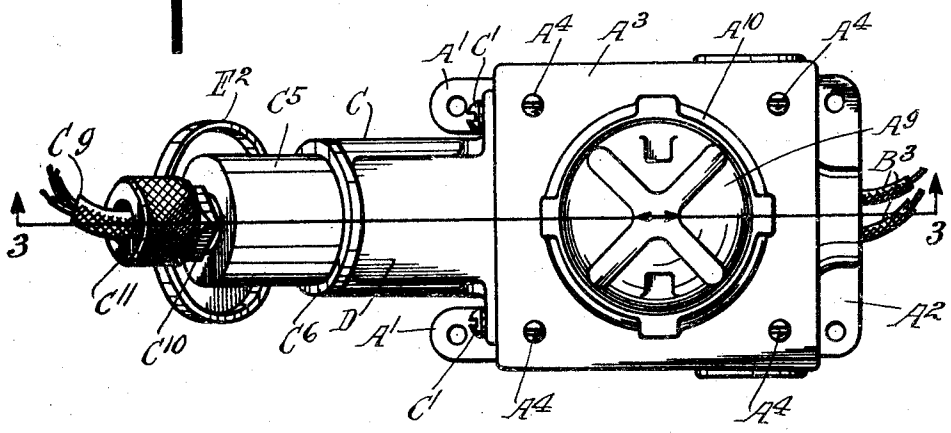
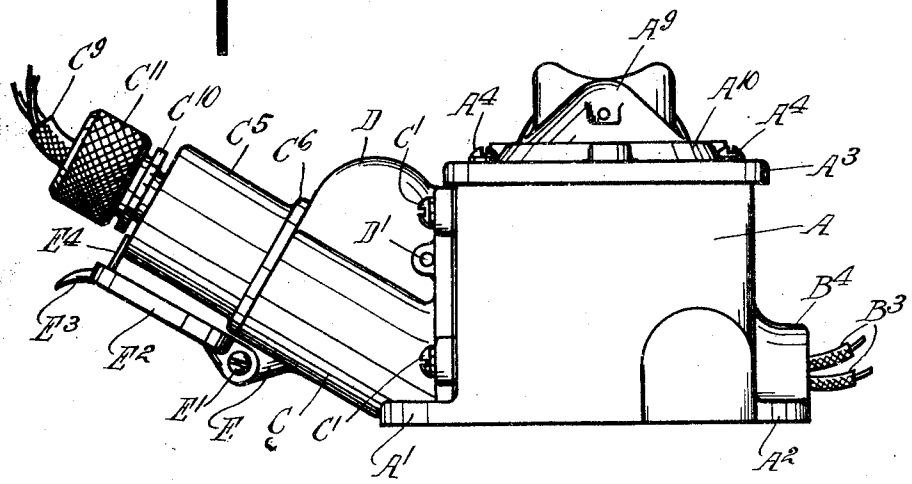


Fig. 2.



INVENTOR
William A. Wulle
BY
Parks & Watts
ATTORNEY

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Fig. 3.

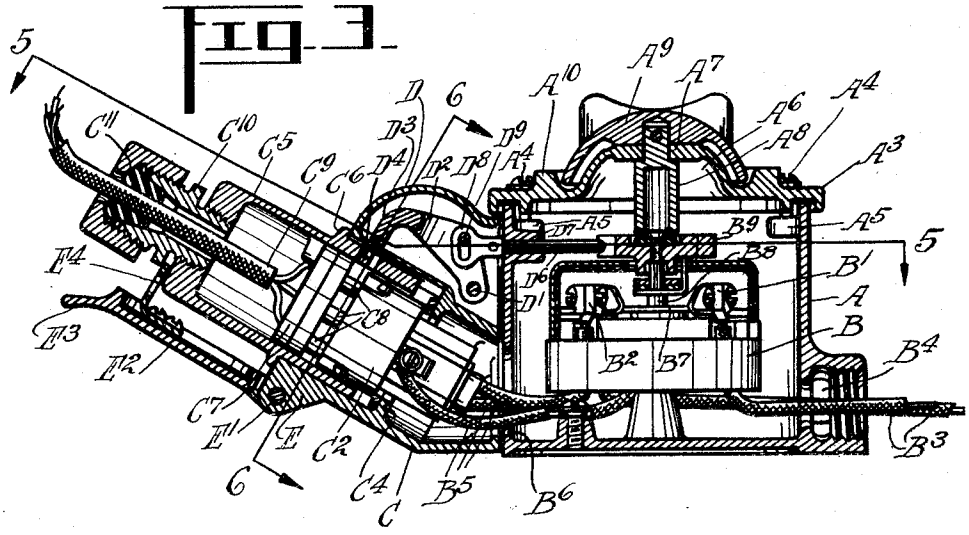
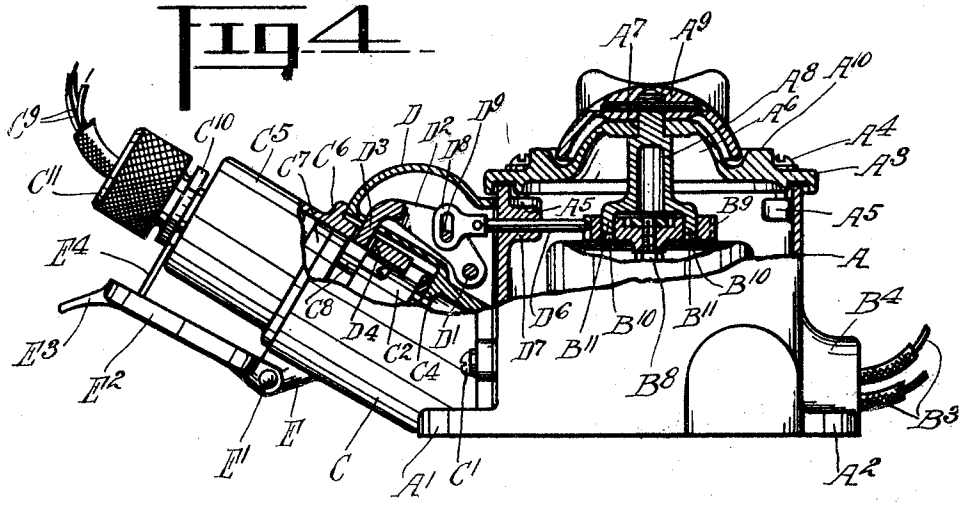


Fig. 4.



INVENTOR
William A. Wulle
BY
Parker & Carter
ATTORNEY

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Fig. 5.

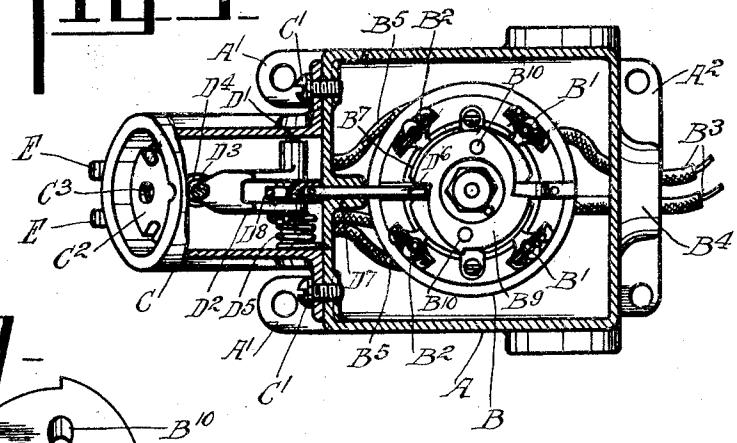


Fig. 7.

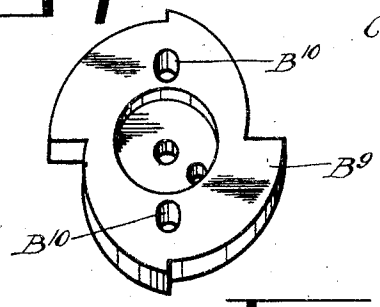
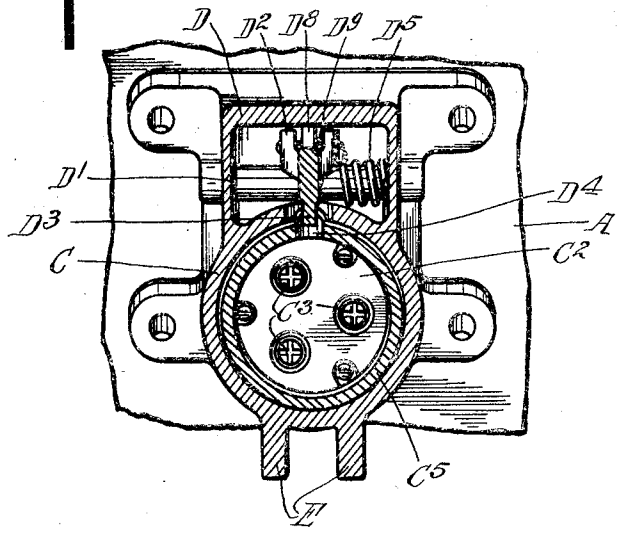


Fig. 6.



INVENTOR
William A. Wulle
BY
Parks & Curtis
ATTORNEY

Patented Aug. 11, 1931

1,818,290

UNITED STATES PATENT OFFICE

WILLIAM A. WULLE, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE PYLE-NATIONAL COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF NEW JERSEY

COMBINED SWITCH AND TERMINAL BLOCK

Application filed March 6, 1929. Serial No. 344,613.

My invention relates to improvements in combined switch and terminal block and has for one object to provide a switch and terminal plug combination wherein, if the connecting plug is in place, the switch may be turned on or off, wherein the plug is locked against withdrawal when the switch is on, and wherein the switch cannot be turned on accidentally when the plug is not in position.

My invention is illustrated more or less diagrammatically in the accompanying drawings wherein Fig. 1 is a plan view. Fig. 2 is a side elevation. Fig. 3 is a section along the line 3—3 of Fig. 1. Fig. 4 is a side elevation with parts in section showing the switch in on position. Fig. 5 is a section along the line 5—5 of Fig. 3 with plug omitted. Fig. 6 is a section along the line 6—6 of Fig. 3. Fig. 7 is a perspcetive view of the latch-controlling pawl.

Like parts are indicated by like figures in the drawings and specification.

My invention has been illustrated in connection with a switch, terminal plug combination, such as is primarily adapted for use in connection with railroad, train and locomotive lighting and control systems, though it will be understood that my invention might with equal facility be employed for other purposes.

A is a switch housing adapted to be bolted in place by screws or bolts associated with the holding ears A^1, A^2. A^3 is a cover for the housing held in place by screws A^4, engaging lugs A^5 in the interior of the housing. This cover has a central dome-shaped portion A^6, with at its center an enlarged bearing and guide path A^7 in which is rotatively mounted the switch-operating shaft A^8, which carries at its outer end pinned thereon the switch handle A^9, bowl-shaped to overlie the dome and form with the ridge A^{10} on the cover a tortuous passage to protect the interior of the housing against entrance of foreign matter through the bearing between the shaft A^7 and the shaft A^8.

Contained within the housing is the switch block B. It is provided with a plurality of terminals B^1, B^2. The terminals B^1 are associated with conductors B^3 which extend out through the opening B^4 in the housing, which opening is preferably threaded to take the end of a conduit not here shown. The terminals B^2 are associated with conductors B^5 extending out through the aperture B^6 in the wall of the housing.

Associated with these terminals B^1, B^2, are switch plates B^7, adapted to be rotated by the pin B^8, driven by the lock pawl B^9, which pawl is apertured at B^{10}, and engaged by the fork B^{11} on the end of the driving A^8, so that the operator may, by manipulating the handle, control the switch.

C is a plug socket mounted on the side of the housing A by means of screws C^1. This socket masks the opening B^6. It contains a terminal plug C^2, having three terminals C^3, associated respectively with the conductors B^5. This terminal plug rests on and is supported by the flange C^4 in the socket C, there being a clearance between the inside wall of the socket and the plug to engage the removable terminal plug C^5, which is flanged at C^6 to limit its movement inwardly toward the socket, contains the spring terminal block C^7, having spring contact pins C^8 to engage the terminals C^3. These pins are connected to the conductors C^9, which extend out through the gland C^{10}, and stuffing box C^{11} from the plug.

D is a latch housing mounted on socket C and interposed between it and the main switch housing, extending across it is a pivot pin D^1, on which is mounted for rotation the latch D^2, having a nose D^3 adapted to penetrate the wall of the socket C and engage an aperture D^4 in the wall of the plug C^5. D^5 is a coil spring associated with the latch D^2 tending normally to hold it in the retracted position. D^6 is a slideable connecting rod mounted in a sleeve D^7 in the wall of the housing A. It carries a slotted working head D^8 engaging a pin D^9 on the latch. The inner end of this connecting rod abuts the lock pawl B^9 with its cam or curved surfaces so disposed that when the switch is on the latch is down in the position shown in Fig. 4, making it impossible to withdraw or insert the plug, and when the switch is in the off position raising the latch as shown in Fig. 3 so

that the plug may be inserted or withdrawn at will.

E indicates ears on the socket C. E^1 a cover pin whereby the cover E^2 is pivoted on the edge. A spring not shown tends yieldingly to hold the cover in position to close the plug. E^3 is a handle whereby the cover may be manipulated. E^4 is a lock plate carried on the inside of the cover, serving a dual purpose, when in the position shown in 3 and 4 it engages a shoulder, as indicated, on the terminal plug and locks it against withdrawal. If the plug is out the door is closed and the lock plate closely engages the socket wall to interpose a stop in the path of the latch D^2 to prevent moving the switch to the wrong position.

This arrangement of parts thus makes it impossible for the switch to be turned on when the plug is absent. It also makes it impossible for the plug to be put in or taken out when the switch is in any position other than the open position.

It will be evident that while I have shown in my drawings an operative device, still many changes might be made both in size, shape and arrangement of parts, and I wish therefore my drawings to be regarded as, in a sense, diagrammatic.

In Figure 4, it will be noted that the coil spring X around the pivot pin of the cover tends to yieldingly hold the cover in closed position and when the cover is open and the plug is in place tends to yieldingly urge the cover toward the plug to make the finger E^4 interlock with and hold the plug in position.

I claim:

1. In combination a switch, a socket and a removable plug, and means associated with them for preventing withdrawal of the plug when the switch is in the "on" position, means for preventing turning of the switch into the "on" position when the plug is out, and means for preventing insertion of the plug when the switch is "on."

2. In combination a switch, a socket and a removable plug, and means associated with them for preventing withdrawal of the plug when the switch is in the "on" position, means for preventing the turning of the switch into the "on" position when the plug is out, and means for preventing insertion of the plug when the switch is "on," said means comprising a latch, a cam operated responsive to movement of the switch, and a member on the plug adapted to interlock with the latch, a cover for the plug adapted to engage the plug when it is in position to lock it in place, and a member thereon adapted to lie in the path of the latch when the plug is out to prevent movement of the switch.

3. In combination a switch, a socket and a removable plug and means associated with them for preventing withdrawal of the plug comprising a cover for the socket, yielding means tending normally to urge the cover towards the closed position, a flange on the cover adapted to engage the plug and hold it in place.

4. In combination a switch, a socket and a removable plug, means associated with them for preventing withdrawal of the plug and for preventing movement of the switch into the "on" position when the plug is absent, said means comprising a cover for the socket, a blade carried by the cover adapted to engage the plug to prevent its withdrawal, yielding means for holding the blade in position, a member moved by the switch as it travels into the "on" position, said blade being adapted to lie in the path of such member when the plug is absent, and thereby prevent movement of the switch.

5. An electric switch comprising a housing, circuit making and breaking elements therein, an operating handle therefor projecting therefrom, a socket associated with the housing, a cover therefor, a plug adapted to penetrate the socket, a finger on the cover adapted to engage the plug and prevent withdrawal thereof from the socket, a latch and operating means therefor associated with the circuit making and breaking elements to cause interlock of latch and plug when the circuit is closed to prevent withdrawal of the plug.

6. An electric switch comprising a housing, circuit making and breaking elements therein, an operating handle therefor projecting therefrom, a socket associated with the housing, a cover therefor, a plug adapted to penetrate the socket, a finger on the cover adapted to engage the plug and prevent withdrawal thereof from the socket, a latch and operating means therefor associated with the circuit making and breaking elements to cause interlock of latch and plug when the circuit is closed to prevent withdrawal of the plug, the finger on the cover adapted when the cover closes the socket to project into the path of the latch to prevent its movement and thereby prevent movement of the making and breaking elements into the circuit closed position when the plug is out of the socket.

7. An electric switch comprising a housing, circuit making and breaking elements therein, an operating handle therefor projecting therefrom, a socket associated with the housing, a cover therefor, a plug adapted to penetrate the socket, a finger on the cover adapted to engage the plug and prevent withdrawal thereof from the socket, a latch and operating means therefor associated with the circuit making and breaking elements to cause interlock of latch and plug when the circuit is closed to prevent withdrawal of the plug, yielding means tending to force the cover toward and into the closed position, such means being adapted also to yieldingly

hold the finger on the cover in interlocking engagement with the plug.

8. An electric switch comprising a housing, circuit making and breaking elements therein, an operating handle therefor projecting therefrom, a socket associated with the housing, a cover therefor, a plug adapted to penetrate the socket, a finger on the cover adapted to engage the plug and prevent withdrawal thereof from the socket, a latch and operating means therefor associated with the circuit making and breaking elements to cause interlock of latch and plug when the circuit is closed to prevent withdrawal of the plug, the finger on the cover adapted when the cover closes the socket to project into the path of the latch to prevent its movement and thereby prevent movement of the making and breaking elements into the circuit closed position when the plug is out of the socket, yielding means tending to force the cover toward and into the closed position, such means being adapted also to yieldingly hold the finger on the cover in interlocking engagement with the plug.

Signed at Chicago, county of Cook, and State of Illinois, this 28th day of February, 1929.

WILLIAM A. WULLE.