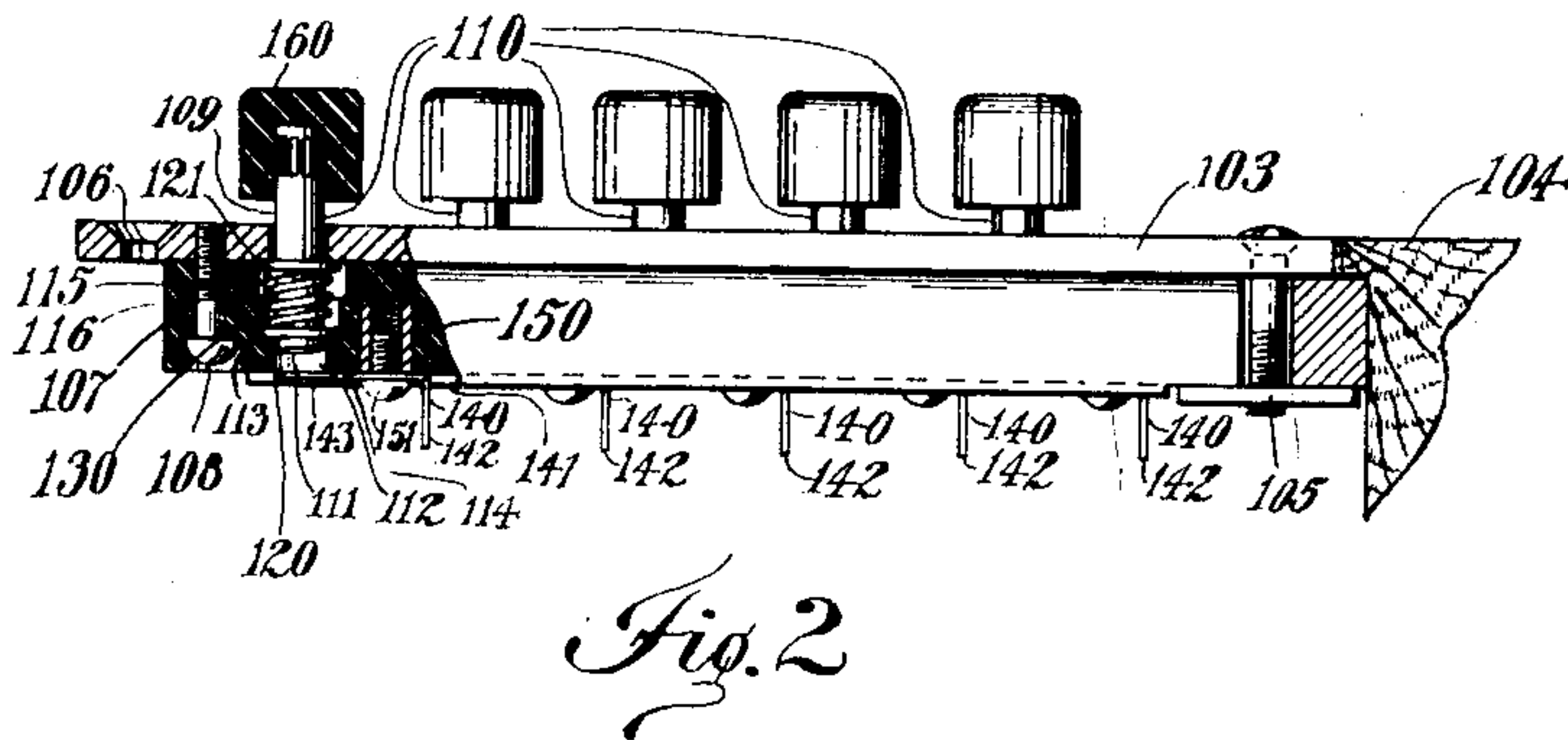
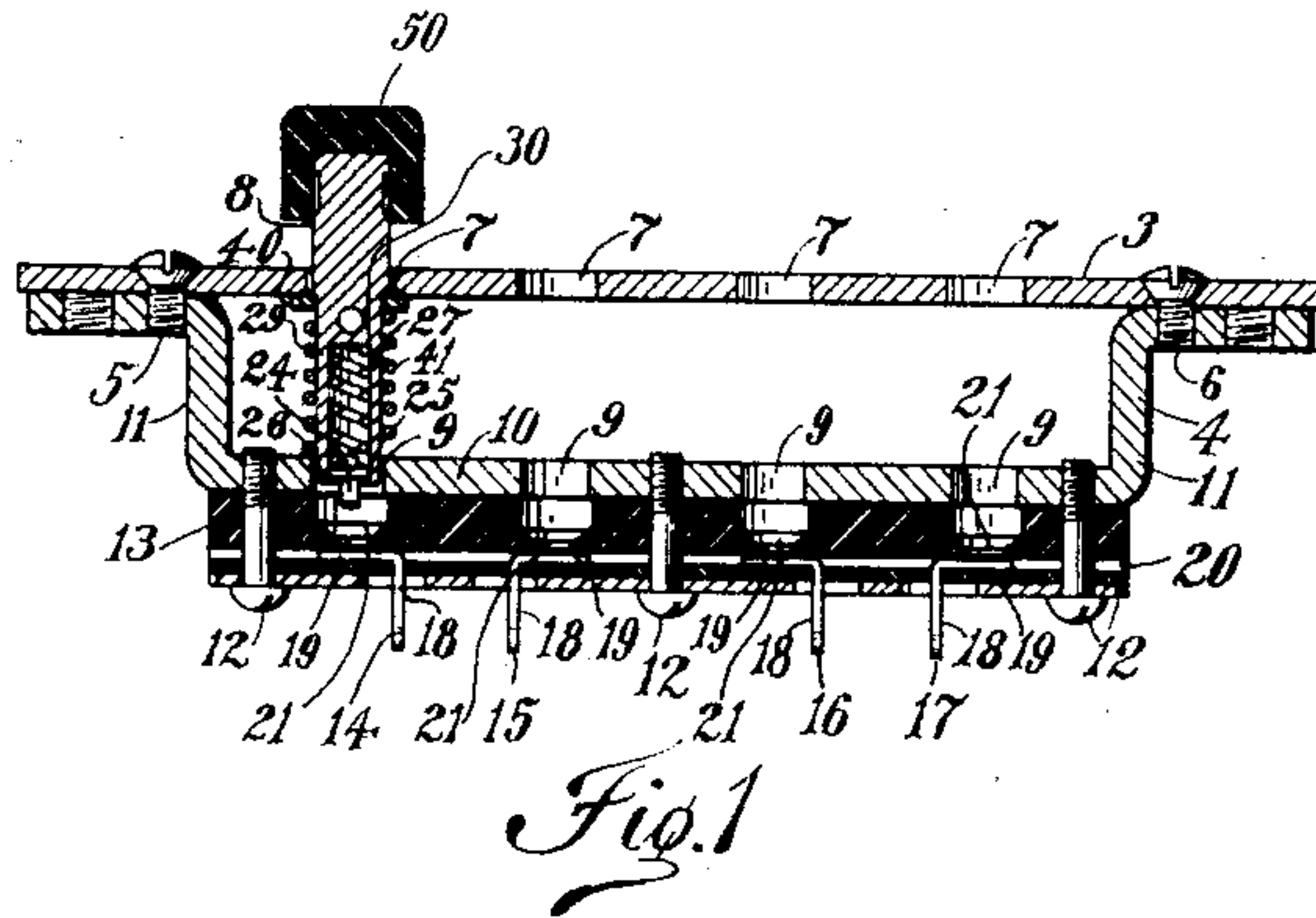


R. H. MANSON.
CIRCUIT CONTROLLER.
APPLICATION FILED JULY 13, 1914.

1,215,566.

Patented Feb. 13, 1917.



WITNESSES:
John S. Richey
Meta M. Smithberger

INVENTOR.
Ray H. Manson
BY *J. O. Richey*
His ATTORNEYS.

UNITED STATES PATENT OFFICE.

RAY H. MANSON, OF ELYRIA, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO
STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY, OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK.

CIRCUIT-CONTROLLER.

1,215,566.

Specification of Letters Patent.

Patented Feb. 13, 1917.

Application filed July 13, 1914. Serial No. 850,640.

To all whom it may concern:

Be it known that I, RAY H. MANSON, a citizen of the United States, residing at Elyria, in the county of Lorain and State of Ohio, have invented certain new and useful Improvements in Circuit-Controllers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to circuit controllers, and more particularly to a bank of push button switches which finds a special, though not exclusive, use in connection with telephone switchboards, where it may be used to control the circuit connections between ringing generators and telephone lines. A plurality of generators or other sources of current are employed, each adapted to furnish a particular type of current for the purpose of selecting and signaling one of many stations upon a party line.

The principal object of my invention is to produce apparatus of the type mentioned which can be simply and cheaply made, installed and operated, and which will, at the same time, make a good electrical contact without danger of injury to the parts.

Other objects of my invention and the invention itself will perhaps be better understood from a description of the embodiments illustrated on the drawing.

Figure 1 is a section through one embodiment of my invention.

Fig. 2 is an elevation of a second embodiment showing the parts in elevation.

Referring now to the first embodiment shown in Fig. 1, at 3 is shown a plate which here consists of an escutcheon plate. A frame piece is shown at 4 connected to the escutcheon plate in any suitable manner, such as by screws 5 and 6. The shelf of the switchboard may be cut away and the frame piece and escutcheon plate mounted therein, with the frame piece flush with the face of the shelf. The escutcheon plate is provided with a plurality of perforations 7, through which plungers 8 operate. I have shown but one of these plungers, as the others are duplicates thereof. The frame piece is also provided with a plurality of openings 9

through which the lower ends of the plungers operate. This frame piece is of U shape, as illustrated, the bottom limb 10 of the U being much longer than the side limbs 11.

An insulating member 13 is mounted on the bottom of the limb 10 of the member 4, and is connected thereto by suitable means such as screws 12. The member 13 carries a plurality of terminals 14, 15, 16 and 17. Each of these terminals consists of an angle member having limbs 18, which are substantially parallel to the plungers, and to which the terminals of the electric circuit are connected. The horizontal limbs 19 of these members are mounted in a slot 20 in the member 13 and exposed through recesses 21 in the member 13 to a contact carried by the plunger 8. This contact is illustrated at 24 and carries a collar 25 normally engaging a collar 26 around the edge of a bore 27 in the plunger 8. A spring 29 is provided in the bore 27, abutting at one end against the end 30 of this bore, and at the other end against the back of the collar 25 upon the terminal 24.

The plunger 8 is provided with a collar 40 on the upper end thereof, and a spring 41 abuts at one end against the collar 40 and at the other end against the top surface of the limb 10 of the member 4. One terminal of the circuit is connected through suitable means to the frame 4 or the escutcheon plate 3.

When the plunger is depressed, the spring 41 is compressed, and when the terminal 24 engages the limb 19 of the contact terminal 14, the spring 29 within the bore is compressed and the contacts are held firmly in engagement by said spring. An insulating cap 50 is provided for the plunger 8 to insulate it from the operator's finger when applied thereto.

Referring now to the form shown in Fig. 2, which is still further simplified, the escutcheon plate is shown at 103 and serves as a common contact for one set of terminals. This is connected to the switchboard, a portion of which is shown at 104, in any suitable manner, as by screws 105 inserted through holes 106 in the escutcheon plate. A member 107, preferably made of insulat-

ing material, is mounted upon the bottom of the escutcheon plate in any suitable manner, such as by screws 108, one of which is illustrated. The escutcheon plate is provided with a plurality of holes 109, through which the plungers 110 reciprocate. The member 107 is provided with a plurality of channels, one of which is shown at 111 for the plungers 110. These channels are cylindrical in shape, but of different cross section. The lower section 112 is the narrowest; the intermediate section 113 is wider, so that a shoulder 114 exists between the two sections. The upper section 115 is the widest, and a second shoulder 116 exists between the intermediate section and the upper section. The shoulder 116 by engaging the collar 121 limits the downward movement of the plunger. The three sections of the channel are concentric, and the lower section is of substantially the same diameter as the shaft of the plunger 109. A bearing member 120 is set upon the shoulder 114 and is provided with an opening of substantially the same diameter as the section 112. The bearing member itself is of substantially the same diameter as the section 113. The plunger is provided with a collar 121 of little less diameter than the section 115. A spring 130 is mounted upon the plunger, and abuts at one end against the collar 121 and at the other against the bearing plate 120, so that when the plunger is depressed, this spring will be compressed, and when the plunger is released, the spring will return the plunger to normal position.

A plurality of electric terminals are mounted upon the bottom of the member 107, a channel 141 being cut therein along the length of the member 107 for one end of said terminal members. The terminal members 140 are angle shaped, one limb 142 being normally substantially parallel to the shafts of the plungers. It is to these ends of the terminals that one set of conductors is attached. The other end 143 of each angle shaped terminal extends over the channels 111, and is normally in the path of the end of the plunger shaft 109. When such plunger is depressed, the end of the shaft engages the end 143 of the spring, making electrical connection between the terminal 140 and the escutcheon plate 108. Metal, interiorly screw-threaded collars 150 are sunk into the member 107 and fastened thereto. Screws 151 connect the terminals 140 to the collars 150 and therethrough to the member 107. The ends 143 of the spring 140 are flexible, presenting a cushioning effect, and preventing the bottom of the button 160 from being shoved down hard against the escutcheon plate 108. In bending, the surface of the ends 143 is drawn over the bottom of the plunger 109, making a wiping engagement therewith, and pre-

venting the accumulation of corrosion upon the contacting surface. This always insures a good electrical contact.

I claim:—

1. In a circuit controller, the combination of a perforated plate adapted to be normally employed as a common terminal for a plurality of conductors, an insulating member, means to connect said insulating member to said plate, said insulating member being provided with a plurality of channels concentric with the perforations in said plate, a plurality of push button plungers each adapted to have electrical engagement with said perforated plate, one mounted in each of said perforations and its concentric channel and adapted to reciprocate therein, a spring for maintaining each plunger in normal position, a plurality of contact members mounted upon said insulating member and each extending over the bottom of one of the channels therein and adapted to engage the end of the plunger when it is depressed.

2. In a device of the class described, the combination of a plate provided with a plurality of perforations and adapted normally to serve as a common terminal for a plurality of conductors, an insulating member and means to mount said insulating member upon the bottom of said plate, said insulating member provided with a plurality of channels concentric with the perforations in the plate, a plurality of push button plungers each normally engaging said plate, one mounted in each of the perforations in said plate and in the channel of the insulating member concentric therewith, said plungers adapted to reciprocate in said perforations and channels, a spring for returning said plungers to normal, a plurality of terminals connected to said insulating member, one having a flexible end extending over the bottom of the channel and adapted to engage the plunger when it is depressed to make a wiping electrical contact therewith.

3. In a device of the class described, the combination of a plate having a perforation therein, said plate adapted normally to serve as a terminal of an electrical circuit, an insulating member having a channel therein and means to mount said insulating member upon the bottom of said plate with the channel concentric with the perforation in the plate, the channel extending clear through the insulating member, a push button plunger normally engaging said plate mounted to reciprocate in said perforation and channel, a spring for returning said plunger to normal position, an electrical terminal mounted on said insulating member, said terminal having a flexible end extending over the bottom of said channel and adapted to engage said plunger when the plunger is depressed.

4. In a device of the class described, the combination of a perforated plate adapted normally to serve as a terminal of an electric circuit, an insulating member having a channel therein extending through said member, means to connect said member to said plate with the channel concentric with the perforation in the plate, an electrical terminal mounted upon said member and having a flexible end extending over the mouth of the channel, a push button plunger adapted to engage said plate mounted to reciprocate in said perforation and channel, a collar on said plunger permitting the plunger to be reciprocated in the channel but retaining it therein, a shoulder in said channel, a bearing plate on said shoulder, a spring between the bearing plate and the collar on the plunger, said plunger when depressed having a wiping engagement with the flexible end of the terminal to complete a circuit between the conductor connected to said terminal and the conductor connected to said plate.

5. In a device of the class described, the combination of a plate having an opening therein, an insulating block having a channel therein, means to connect said block to

said plate with the channel substantially concentric with the perforation in the plate, 30 a plunger mounted to reciprocate in said perforation and channel, a shoulder in said channel, a bearing plate on said shoulder, a collar on said plunger, a spring between said bearing plate and said collar, a second 35 shoulder in said channel for limiting the movement of the plunger and adapted to engage the collar on the plunger to limit the downward movement of said plunger, and an electrical terminal mounted on said 40 insulating member having a flexible end in the path of the plunger adapted to make a wiping engagement with said plunger when the same is depressed, both said plate and said terminal adapted to be connected to an 45 electric conductor, whereby a circuit may be closed when said plunger is depressed to engage said terminal.

In witness whereof, I have signed my name in the presence of two witnesses this 50 6th day of July, 1914.

RAY H. MANSON.

Witnesses:

GEO. E. ROBERTS,
L. A. BUFAND.