May 30, 1939. F. ARNDT ET AL 2,160,635

ELECTRIC CONTROLLER

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Fig. 1.

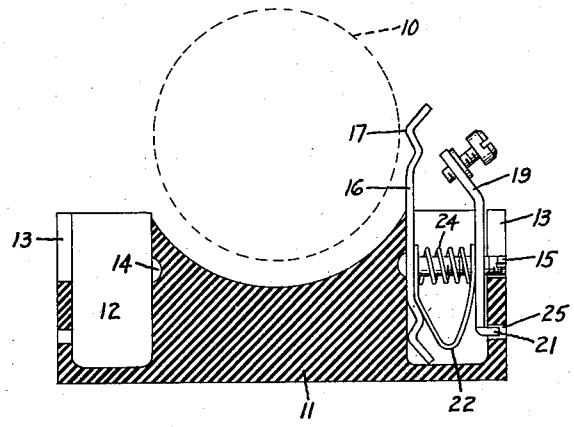


Fig. 2.

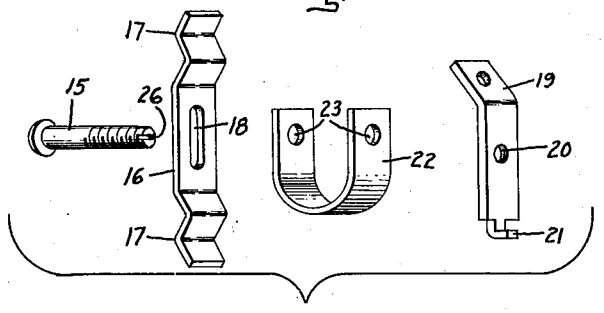
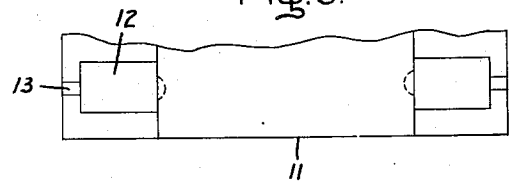


Fig. 3.



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UNITED STATES PATENT OFFICE

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ELECTRIC CONTROLLER

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6 Claims. (Cl. 200—166)

This invention relates to electric controllers and has for its object a simple, reliable, and inexpensive contact finger for electric controllers.

More particularly, this invention has for its object a contact finger which is held in place with respect to its support by means of a single member, such as a screw, whereby the parts are readily assembled, or disassembled for replacement. In carrying out the invention the contact finger, which is secured in a suitable recess provided for it in the supporting body, is connected by means of a screw to a terminal member in such manner that by turning the screw after the parts have been inserted in the recess the terminal is firmly secured in place. A current supply strip and a spring are provided between the finger and the terminal member, the spring serving to hold the strip in engagement with the finger and the terminal so as to provide a good current conducting path between them and also serving to provide for limited relative movement of the finger.

The special advantages of this arrangement consist in that a minimum number of parts are used and economy of material is thus obtained and further each part can be separately changed. Furthermore, the finger is securely held in the recess while it is resiliently movable to provide for engagement of the contact making and breaking portion of the finger with a cooperating contact member, such as the movable contact of a drum controller.

For a more complete understanding of this invention, reference should be had to the accompanying drawing Fig. 1 of which shows a contact finger assembly for a drum controller embodying the invention; Fig. 2 is a view showing the parts disassembled, while Fig. 3 is a fragmentary plan view of the insulating supporting base for the fingers.

Referring to the drawing, we have shown our invention in one form as applied to the contact fingers of a rotary drum controller, the rotatably mounted drum bearing the movable contact segments being represented by the dotted circle 10. Secured in suitably spaced relation with the drum is a supporting base 11 for the contact fingers, this base being shown as made of electrically insulating material. Adjacent each side of the drum 10 is a series of recesses 12 for a corresponding series of contact fingers. Two only of these recesses are shown in the drawing, a contact finger assembly being shown in one of these recesses.

In the arrangement shown each recess is substantially rectangular in cross-section as seen in the drawing. The outer wall, i. e., the wall most remote from the drum, is provided with a slot 13 which extends downward a distance equal to approximately one-half the depth of the recess. The opposite wall is provided with a depression or recess 14 adapted to receive the head of a securing bolt or screw 15 which in the assembly of the parts extends from the recess 14 in a substantially horizontal direction as viewed in Fig. 1 with its outer end lying in the slot 13.

The contact finger 16 consists of a strap of electrically conducting material having each end constructed to form a circuit making and breaking contact 17, one end only being used at any particular time. Near its center the finger is provided with an oblong hole 18 through which the bolt or screw 15 loosely extends.

Additional parts are an electrically conducting terminal strap 19 provided with a tapped central aperture 20 adapted to receive the threaded end of the screw 15 and at its lower end with a laterally extending projection 21, a flexible current conducting strip 22 formed into the shape of an open loop and provided with an aperture 23 at each end for receiving the screw 15, and a helical spring 24 which encircles the screw and lies between the ends of the strip 22.

The parts thus assembled, as shown in Fig. 1, but with the screw turned to bring the finger 16 and the terminal strap 19 closer together are inserted endwise in parallel relation with each other freely into the aperture 12 and the screw then turned to separate the finger and the terminal, the positioning projection 21 on the terminal entering a recess or aperture 25 provided for it in the outer wall of the recess. As shown, the outer end of the screw is provided with a slot 26 whereby it may be turned by means of a screw-driver. The screw is turned until the terminal 19 is forced firmly against the outer wall of the recess, the head of the screw being firmly seated in the recess 14. This firmly clamps the terminal and the screw in the recess while the finger is resiliently held against the inner wall of the recess by the spring 24. Also, the spring forces the ends of the conductor strip 22 apart into engagement with the finger and the terminal, thereby forming good electrical contacts at these points so that the finger is electrically connected to the terminal through the strip. When a contact on the drum 10 comes against the contact portion 17 of the finger, the finger is pressed back about its lower end as a pivot against the forces applied by the spring

24, the spring thus maintaining a good electrical contact between the finger and the drum contact.

If a contact assembly is to be changed, then it is necessary only to turn the screw 15 in a direction to move the terminal strap 19 toward the finger. When this movement is so advanced that the projection 21 has left the opening 25 and the head of the screw can be slipped out of the recess 14, then all the parts can be drawn as a whole out of the recess. The assembly can now be replaced by a new one, or the contact finger, since it is provided at each end with a circuit making and breaking portion, can simply be reversed and its use continued. This reversibility of the finger is further assured by the oblong opening 18 in the finger since as shown the screw when the assembly is put in position is somewhat nearer the lower end than the upper end of the finger, the lower end of the finger being in engagement with the lower or bottom wall of the recess.

Obviously, if desired, the parts with the exception of the screw may be permanently connected together as by means of a special bolt, and secured in the recess 12 by means of a special screw which engages only the terminal member 19.

While we have shown a particular embodiment of our invention, it will be understood, of course, that we do not wish to be limited thereto since many modifications may be made, and we therefore contemplate by the appended claims to cover any such modifications as fall within the true spirit and scope of our invention.

What we claim as new and desire to secure by Letters Patent of the United States, is:

1. The combination in an electric controller of a contact finger provided with an aperture, a terminal strap provided with an aperture, one of said apertures being tapped, a screw extending through said apertures, a support provided with walls between which said finger and said terminal are inserted and secured by turning said screw to clamp said terminal against one of said walls, and a spring for holding said finger against an opposite wall of said support.

2. The combination in an electric controller of a contact finger provided with an aperture, a terminal strap provided with a tapped aperture, a screw provided with a head and a threaded end extending through said apertures to secure said finger to said terminal, a support provided with walls between which said finger and said terminal are inserted and secured by turning said screw to clamp said terminal against one of said walls, the head of said screw engaging an opposite wall of said recess, and a spring between said finger and said terminal for holding said finger against an opposite wall of said support.

3. The combination in an electric controller of a contact finger provided with an intermediate aperture, a terminal strap provided with a laterally extending projection and with a central tapped aperture, a support provided with a recess in which said finger and said terminal are inserted, a screw extending through the aperture in said finger and having a threaded end cooperating with the tapped threaded aperture in said terminal, a wall of said support being provided with a recess for said projection and an opening for the threaded end of said screw whereby said screw can be turned to secure said terminal against said wall, and a spring between said finger and said terminal for resiliently holding said finger against an opposite wall of said support.

4. The combination in an electric controller of a contact finger provided with an intermediate aperture, a terminal strap provided with a central tapped aperture, a support provided with a recess in which said finger and said terminal are inserted, a screw extending through the aperture in said finger provided with a head and a threaded end cooperating with the tapped aperture in said terminal, a wall of said support being provided with a recess for the head of said screw and an opposite wall with an opening for the threaded end of said screw whereby said screw can be turned to secure said terminal against said second wall, and a spring between said finger and said terminal for resiliently securing said finger against said first wall.

5. The combination in an electric controller of a strap forming a contact finger provided with an electrical contact on each end and with a central aperture, a terminal strap provided with a laterally extending projection and with a central tapped aperture, a support providing a recess having walls of electrically insulating material in which said finger and said terminal are inserted endwise in substantially parallel relation with each other, a screw extending through the aperture in said finger having a head and a threaded end cooperating with the tapped aperture in said terminal, a wall of said support being provided with a slot for the threaded end of said screw and a recess for said projection, and an opposite wall being provided with a recess for the head of said screw whereby said screw can be turned to clamp said terminal strap against said first wall, a loop-shaped flexible conducting member having an aperture at each end for said screw, and a helical compression spring on said screw between the ends of said member for resiliently securing said finger against said second wall and the ends of said member against said finger and said terminal.

6. The combination in an electric controller of a contact finger, a terminal member provided with a tapped aperture, a screw cooperating with said aperture, a support provided with oppositely disposed walls between which said contact finger and said terminal strap are positioned with said screw extending across the space between said walls, said terminal strap being secured to one of said walls by turning said screw to clamp said terminal strap against said wall with the opposite end of said screw engaging the opposite wall, and a spring carried by said screw for holding said contact finger against said opposite wall.

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