F. E. CASE.
ADJUSTABLE CONTROLLER FINGER.
APPLICATION FILED JULY 19, 1904.
ADJUSTABLE CONTROLLER-FINGER.


To all whom it may concern:

Be it known that I, FRANK E. CASE, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Adjustable Controller-Fingers, of which the following is a specification.

My present invention relates to improvements in adjustable contact-fingers for use in motor-controlers, reversing-switches, and similar electric-circuit-governing devices.

In controller-fingers commonly used it is necessary to make provision for adjusting them relatively to their cooperating contact members, for the reason that on account of slight irregularities in the cast and machined parts and the requirement of a support of some insulating material no two fingers would otherwise receive the same alinement. It is evident that where the fingers are resilient or are spring-pressed, as they must necessarily be in order to secure a close and efficient contact, any change in the alinement of a finger produces a variation in the pressure, with which the finger bears against its cooperating member, a deflection from the normal in one direction producing too heavy a pressure, and consequently too much friction and wear between the parts, and a deflection in the opposite direction resulting, if in any contact at all, in too light a pressure between the parts and a bad contact. Adjustability is also desirable to compensate for the wear which takes place during service in order that the predetermined pressure between contacts may be maintained.

It has been proposed to provide a resilient finger with means to vary its inclination with respect to its support; but the arrangements heretofore devised have produced a change in the effective tension of the finger, because, assuming the finger to be adjusted so as to have a normal tension, a further adjustment in one direction increases the tension and an adjustment in the opposite direction decreases it.

The object of the present invention is to so construct contact-fingers that they may be adjusted to compensate for any irregularities which may exist in parts thereof, for defects in mounting, and for wear without altering the effective predetermined tension of the fingers—namely, the pressure with which the contact-tip is held against the cooperating contact-surface.

A further object of my invention is to provide means which may be operated easily and quickly and which shall positively retain the parts in their adjusted positions.

In the accompanying drawings, which illustrate my invention in one of its forms, Figure 1 is a side elevation of my improved contact-finger in operative engagement with a cooperative contact-surface, and Fig. 2 is a cross-section taken on line 2 2 of Fig. 1.

The contact-finger as a whole is indicated by A, and B represents a complementary contact-surface, which may be a segment of a rotatable cylinder or which may have any other desired form.

The finger comprises a suitable base 1, by which it is secured in its position as part of an operative control equipment, the resilient member or stem 2, carrying at its free end the contact-tip 3, the rigid member or backing 4, secured at one end to the resilient stem 2 at a point near the base, and the adjusting means. The resilient member 2 is shown as consisting of the stiff spring-piece 5 and a piece 6, which latter may with advantage be made up of a series of thin copper strips. The contact-tip 3 may be secured to the pieces 5 and 6 in any desired way—as, for instance, by riveting.

The adjusting means for the finger is illustrated in the form of a set-screw 7, passing freely through a fixed part which may comprise a stiff plate or arm 8, secured to the base 1 by means of screws or rivets which hold the stem 2 in place and screw-threaded into the backing 4. It is apparent that when the set-screw is operated the only effect upon the stem is to move it through an angle about the point a as a center in the same manner that it, if rigid and pivoted at a, would be swung about its pivot, the effective portion—that beyond the point b, the point at which the members 2 and 4 are secured together—remaining entirely undisturbed. Consequently whenever the contact-tip is adjusted so as to be deflected through a predetermined distance upon making contact the pressure between
the two contact-surfaces will be the same irrespective of the angle which the finger makes with its support.

The set-screw 7, as illustrated, consists of a threaded shank 9, the head 10, the collar 11, and a neck 12 between the head and the collar. The neck of the set-screw is seated in an open-ended slot in the arm 8, while the head and collar hold the screw against axial movement. The collar 11 is provided with one or more flat faces 13, which are adapted to be engaged by the lips 14 of the spring-catch 15 in order to hold the set-screw against rotation. The locking-spring 15 is conveniently positioned by having one end thereof secured in place in common with the parts 2 and 8. In order to adjust the finger, the locking-spring 15 is moved out of engagement with its collar 11, whereupon the set-screw may be turned to give the contact-tip its desired position. Upon releasing the spring 15 it again engages the flat face or faces of the collar and holds the screw against rotation and the parts in their adjusted positions.

The member 4 when constructed somewhat along the lines illustrated possesses functions more important than that of a mere nut for the reception of the end of the set-screw. By making it of a considerable length and forming it with an offset portion 16 for securing it to the resilient member of the finger at a point near the base the effective length of the resilient member need not be very materially decreased, and at the same time the hole for receiving the set-screw may be so stationed that no difficulty is experienced in turning the screw. The free end of the member serves as a stop which engages the resilient member and limits its rearward movement, thereby protecting it from injury. The contact-tip, as shown, is provided with a lug 17, which is arranged to engage with the member 4 to limit the forward movement of the tip and resilient member. This construction also enables the resilient member to be placed under an initial tension when in its extreme forward position, thereby affording a distinct and material pressure between the contact-surfaces before the contact-tip has begun to move backwardly.

From the above description of my invention it is evident that adjustment is provided for changing the position of the contact-surface of the finger without affecting the pressure with which the finger will bear upon a cooperating contact member under conditions otherwise equal, thereby giving the greatest efficiency. It is further evident the adjustment may be rapidly and effectively made and in a manner which obviates the use of locking or jam nuts.

Although it is apparent that peculiar advantages result from certain of the details of construction illustrated, yet the present invention in its broader aspects is not limited to such details.

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

1. A contact-finger embodying a resilient contact member, a support, and means for changing the inclination of the resilient member with respect to its support without altering the effective tension of the resilient member.

2. A contact-finger embodying a resilient member fixed at one end to a support, and means for changing the inclination of the resilient member with respect to its support without altering the effective tension of the resilient member.

3. A contact-finger embodying a resilient member and its support, a rigid member, and adjusting means between the rigid member and the support, said rigid and resilient members being secured together at a point intermediate the support and the adjusting means.

4. A contact-finger embodying a resilient member, a rigid member mounted thereon, a support for the resilient member, and adjusting means between said support and the rigid member.

5. A contact-finger embodying a resilient member, a rigid member secured to the resilient member at one point and normally out of engagement therewith throughout the remainder of its length, a support, and adjusting means between the support and said rigid member.

6. A contact-finger embodying a resilient member, a rigid member secured at one end to the resilient member and normally out of contact therewith throughout the remainder of its length, means for adjustably fixing the rigid member, and a stop on one of said members for limiting the relative movements thereof.

7. A contact-finger embodying a resilient member and its support, a rigid member mounted upon the back of the resilient member and adjustably connected with said support, and a stop on one of said members for limiting the forward movement of the resilient member with respect to the rigid member.

8. A contact-finger embodying a resilient member and its support, a rigid member secured to said resilient member near its fixed end and extending toward the free end of the resilient member but out of contact therewith, a lug upon the resilient member for engaging the rigid member to limit the relative movements of the two members, and an adjustable connection between the rigid member and the support.

9. A contact-finger embodying a resilient member and its support, means for placing said member under an initial tension, and means for changing the inclination of the resilient member with respect to its support.

10. A contact-finger embodying a resilient member and its support, means for changing the inclination of the resilient member with respect to its support.
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without altering the initial tension of the resilient member.

10. A contact-finger embodying the contact member and its support, an adjusting member and its support, an adjusting-screw between said member and the support, and a spring-catch for locking the adjusting-screw in position.

11. A contact-finger embodying the contact member and its support, an adjusting member and its support, an adjusting-screw between said contact member and the support, fixed collars for preventing axial movement of the screw, and a catch for normally preventing rotary movement thereof.

In witness whereof I hereunto set my hand this 18th day of July, 1904.

FRANK E. CASE.

Witnesses:

Benjamin B. Hull,
HeLEN Orford.