July 7, 1931. C. A. RASMUSSEN 1,813,544

ELECTRICAL CONTROLLER

Filed June 5, 1929

Fig. 1.

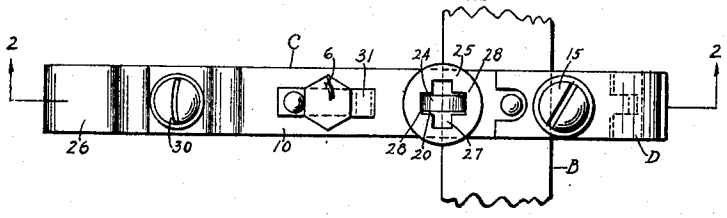


Fig. 2

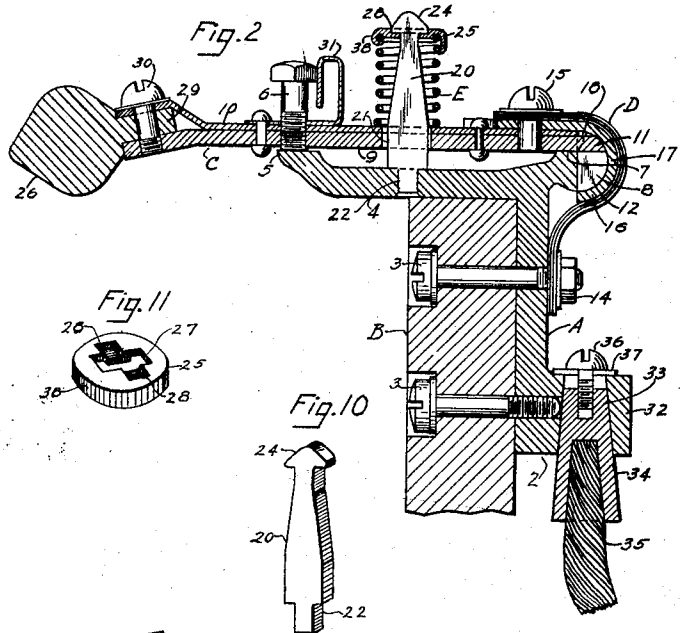


Fig. 3

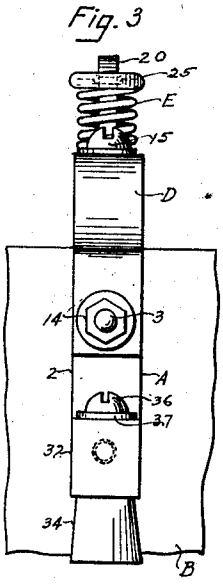


Fig. 11

Fig. 10

Fig. 6

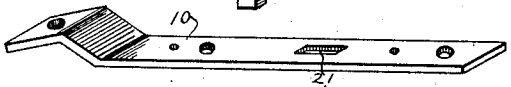


Fig. 8

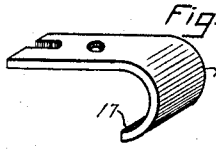


Fig. 5



Fig. 9

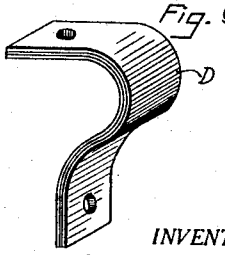


Fig. 7

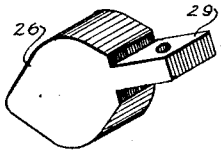
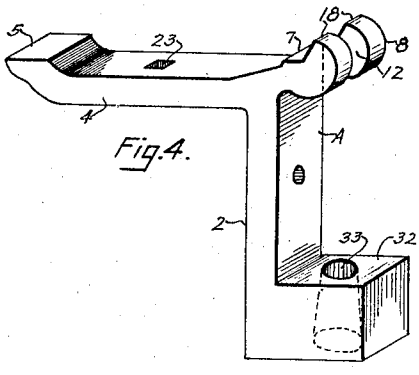


Fig. 4.



INVENTOR.
C.A.Rasmussen.
Fisher, Moser & Moore
ATTORNEY.

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UNITED STATES PATENT OFFICE

CHRISTIAN A. RASMUSSEN, OF CLEVELAND, OHIO, ASSIGNOR TO THE EUCLID ELECTRIC & MANUFACTURING COMPANY, OF EUCLID, OHIO, A CORPORATION OF OHIO

ELECTRICAL CONTROLLER

Application filed June 5, 1929. Serial No. 368,725.

My invention relates to an improvement in electrical controllers, and more particularly in the contract devices for controllers of the rotatable drum type. Thus my object in general is to provide a contact finger assembly of simple, inexpensive and durable construction which may be readily installed in such controllers, and also conveniently inspected and repaired, all as hereinafter shown and described and more concisely set forth in the claims.

In the accompanying drawings, Fig. 1 is a side elevation of my improved contact finger, and Fig. 2 a sectional view thereof on line 2—2 of Fig. 1. Fig. 3 is an end view of the device; Fig. 4 a perspective view of the angular base or body member; Fig. 5 a perspective view of the base member of the finger; Fig. 6 a perspective view of the top member of the finger; Fig. 7 a perspective view of the reversible contact tip; Fig. 8 a perspective view of the finger holding clip; Fig. 9 a perspective view of the laminated copper conductor; Fig. 10 a perspective view of the spring post; and Fig. 11 a perspective view of the detachable cap for the spring post.

The present invention relates to that type of contact device or finger assembly which is adapted to be installed in close and compact relation with others of the same kind opposite a rotatable switch drum in an electrical controller for starting and stopping and/or reversing electric motors. Such contact fingers are subjected to end thrusts, lateral stresses, and twisting strains, and must remain in fixed alignment as closely set to avoid short circuiting. On the other hand, each finger must be conveniently accessible for inspection, replacements, and repairs.

The present finger assembly is constructed to meet these requirements, and it comprises a right-angular main body or supporting member A having a branch 2 adapted to be secured by screws or bolts 3 to one flat side and edge of a bar B as delineated in Fig. 2. The other branch 4 of member A is formed with a bent extremity 5 adapted to serve as a stop or abutment for a set screw 6 carried by a movable contact finger C which rests at its rear end upon a flat seat 7 forming part of a rounded offset and split hinge portion 8 projecting outwardly from the angular corner of member A. Finger C is composed of two flat strips or pieces riveted together, and the base piece 9 is made of heavier stock than the superposed strip 10. Preferably base piece 9 is made of brass and formed with a short narrow end tongue 11 confined within the split portion or vertical slot 12 in hinge portion 8, and the superposed strip 10 is made of copper for better conductivity of the electric current, which is conveyed thereto from supporting member A by short laminated strips D of copper secured at one end by a nut 14 on one of the bolts 3 and at its other end by a screw 15 attached to finger C. Screw 15 also secures a coupling member or clip 16 of hard brass to the finger, that is, clip 16 includes a curved extremity 17 or a semi-circular hook portion which encircles and forms a hinge connection with the rounded portions 8 of member A. Clip 16 is as wide as finger C to span and cover the central slot 12, and the offset hinge portions 8 project beyond flat seat 7 to provide two abutments or end thrust shoulders 18 for the heavier bottom piece 9 of finger C. Finger C may turn or pivot on hinge portions 8, but clip 16 prevents it from being displaced or disconnected. That is to say, screw 15 must be removed before finger C can be detached from supporting member A. In addition, it is necessary to remove a coiled tension spring E from a flat post 20 which projects through a slot 21 in the pieces or parts composing finger C. Thus, post 20 is a flat piece of soft steel having a short stem 22 which projects through a square opening 23 in branch 4 of supporting member A, and the end of stem 22 is upset or riveted to fasten the post rigidly against turning. This post prevents finger C from lateral displacement in respect to branch 4, and being relatively wide the finger cannot rotate readily about this post and bring undue strain on tongue 11, which also acts to prevent lateral displacement of finger C.

The post tapers in width and has a spear-shaped head 24 adapted to interlock with a flanged or dished cap member 25. The coiled spring E is operated to lock these parts together and to apply a yielding pressure to finger C to hold its contact tip 26 against the switch drum when the latter is rotated in respect thereto. However, the spring holding cap 25 may be detached from the post by giving it a quarter turn. Thus, the cap has a slot 27 diagonally in its top at right angles to two depressed seats 28 therein. When head 24 of post 20 is seated within depressions 28 the parts are locked together by spring E, but when the cap is pressed against the spring it may be unlocked from the head and rotated and then detached, thus permitting the spring to be removed, and the finger to swing away from arm 4 a substantial distance. The post is also tapered to permit the finger to swing apart in that way. The copper strip 10 is bent apart from base piece 9 at their outer extremities to overlap the flat extension 29 of the copper contact tip 26, and permit a single screw 30 to fasten this tip replaceably and invertibly thereto. A bent spring 31 riveted to contact finger C adjacent the wrench head on set screw 6, serves to lock this set screw against accidental turning when adjusted.

Branch 2 of body A is also cast or formed with a projecting lug 32 having a tapered opening 33 therein to receive a hollow tapered terminal member 34 to which an electric conductor 35 may be soldered. A screw 36 and washer 37 serve to draw and hold terminal member 34 tightly within the lug.

The cap member 25 is secured to the end of coiled spring E by crimping the flange 38 around the end coil of the spring, thereby fastening the two pieces or parts together to permit them to be handled as a unit and more conveniently than if separated, and also preventing loss or displacement of these pieces separately when detached from the post.

What I claim, is:

1. A contact device for electric controllers, comprising a stationary part, a contact finger hinged to said part having a slot therein, a tapered post fixed to said part and extending through said slot having a locking head, a coiled spring sleeved over said post, and a rotatable cap having a slot and depressions therein to permit detachable interlocking with said head under the tension of said spring.

2. A contact device for electric controllers, comprising a stationary member having a hinge portion, a contact finger seated upon said member, a clip attached to said finger having a hook shaped extension for rotatable connection with said hinge portion a laminated conductor overlapping said clip and said hinge portion and connected at its opposite ends to said finger and stationary member, and a spring to resist pivotal movements of said finger.

3. A contact device for electric controllers, comprising an angular body having a slotted hinge portion extending therefrom, a contact finger having a tongue interengaged with said slotted hinge portion, a clip and a laminated conductor detachably affixed to said finger in encircling connection with said hinge portion, a tapered and flat post secured to said body and extending through a narrow slot in said finger, a coiled spring seated upon said finger around said post, and a slotted cap for said spring in detachable interlocking connection with said post.

4. A contact device for electric controllers, comprising an angular member having a terminal lug formed with a tapered opening, a projection forming part of a hinge on said member, a laminated finger seated upon said member and loosely engaged with said projection, a hook extending from one end of said finger around said projection, a laminated conductor attached to said finger and angular member and encircling said hook, a flat and tapered post on said member, a coiled spring sleeved over said post, and a spring holding cap detachably connected with said post.

5. A contact device for electric controllers, comprising a supporting member, a contact finger pivotally connected with said member, a flat and tapered post upon said member extending through a narrow slot in said finger having a locking head, a coiled spring sleeved over said post, and a slotted cap fastened to one end of said spring adapted to detachably interlock with the head on said post.

In testimony whereof I affix my signature.

CHRISTIAN A. RASMUSSEN.