Feb. 5, 1952 S. F. JARVIS ET AL 2,584,707

SELF-ALIGNING ARMATURE

Filed July 14, 1950

Fig.1.

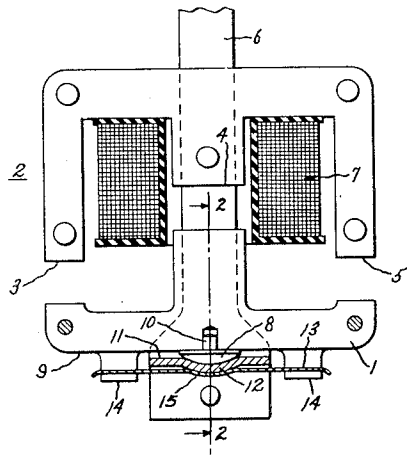
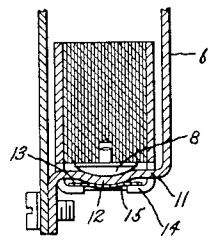


Fig.2.



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Patented Feb. 5, 1952

2,584,707

UNITED STATES PATENT OFFICE

2,584,707

SELF-ALIGNING ARMATURE

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Application July 14, 1950, Serial No. 173,818

3 Claims. (Cl. 175—336)

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Our invention relates to alternating current contactors and more particularly to the means for connecting the operating arm upon which the contacts are mounted to the armature of the contactor. More specfically the invention relates to a frictional self-aligning mounting between an operating member and an armature in the form of a transverse bridging member.

An object of our invention is to connect the operating arm securely to the armature of a contactor with a light weight friction joint mechanism therebetween flexible enough to allow the armature to seat itself evenly against the pole pieces of the electromagnet when the armature is picked up.

To reduce to a minimum the amount of power required from the electromagnet to operate an operating arm supporting multiple contacts, the operating arm must be of light construction. When a bridging armature member is rigidly attached to an operating arm of such light construction, normal factory tolerances for grinding and squareness of parts make it difficult to guide the arm accurately so that the armature seats itself squarely against the poles of the electromagnet. If the armature member is skewed with respect to the poles when it is picked up, an edge of one of the engaging surfaces of the armature strikes a pole face of the electromagnet first, setting up a vibration of the entire movable structure about the pole faces. This vibration is sustained by the inertia of the structure and the pulsating forces between the poles and the armature causing a chattering of the contacts.

According to our invention a contactor provided with an electromagnet having a hollow coil and pole pieces is provided with an operating arm slidably mounted in the hollow center of the coil of the electromagnet for supporting multiple contacts. A U-shaped strap at one end of the operating arm is provided with an outward projecting spherical impression in the closed end of the strap. A bridging armature member for engaging the poles of the electromagnet is provided with a spherical boss thereon for projecting within the impression in the strap and also with pairs of dog flanking the boss. A flat spring secured at each end by the dogs engages the outer surface of the impression to constrain the boss against the closed end of the strap.

For a better understanding of our invention reference is made to one embodiment thereof in which Fig. 1 is a partly sectional view of the apparatus and Fig. 2 is a view along 2—2 of Fig. 1 looking in the direction of the arrows.

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According to the drawing a bridging armature member 1 seats against an electromagnet 2 of a contactor at points 3, 4 and 5. Clearance is provided between the surfaces at 4. Member 1 is secured to an operating arm 6 of the contactor for supporting multiple contacts (not shown) which is slidable in the hollow center of the coil 7 of electromagnet 2. A tack having a spherical surface is secured to a surface 9 of member 1 by a stem 10 projecting into member 1 to provide a boss 8 on surface 9.

U-strap 11 secured to the end of operating arm 6 is provided with an outward projecting spherical impression 12 in its closed end. A spring 13 contacting the outside surface of impression 12 is secured at both ends in a pair of dogs 14 on member 1 flanking boss 8 to secure together bridging member 1 and operating arm 6. Spring 13 is provided with a spherical impression 15 contacting the outer surface of strap 11.

The tension of spring 13 is merely enough to provide a frictional joint between bridging armature member 1 and operating arm 6 so that if armature 1 is tilted with respect to poles 3 and 5, when it is picked up by electromagnet 2, the contact surfaces of armature 1 can seat flatly upon the faces of poles 3 and 5 with no further movement of arm 6.

While certain specific embodiments have been shown and described, it will, of course, be understood that various modifications may be made without departing from the invention. The appended claims are, therefore, intended to cover any such modifications within the true spirit and scope of the invention.

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

1. An adjustable friction mounting between a transverse bridging member and an arm provided with a strap member and having a spherical impression therein, said bridging member having a spherical boss and flanking pairs of dogs provided thereon, and a flat spring secured by said dogs and contacting the raised surface of said impression to force said boss into contact with the recessed surface of said impression whereby said bridging member can tilt with respect to said arm.

2. In an electrical contactor including an electromagnet having a coil and pole pieces, an operating arm slidably mounted in the center of said coil and an armature for bridging said pole pieces, means for pivotally mounting said armature upon said operating arm including a U-shaped strap member having an outward projecting spherical

impression in the closed end thereof and mounted upon the end of said operating arm, said armature being provided with a spherical boss for projecting into the inside surface of said impression and a pair of dogs formed thereon flanking said boss and a flat spring secured at the ends thereof by said dogs and engaging the outside surface of said impression to restrain said armature against said strap, whereby said armature can tilt with respect to said operating arm to seat flatly against said pole pieces in the picked up position of said armature.

3. In an electrical contactor including an electromagnet having a coil and pole pieces, an operating arm slidably mounted in the hollow center of said coil and an armature member for bridging said pole pieces, means for pivotally mounting said armature on said arm including a U-shaped strap member mounted upon an end thereof and provided with a first spherical impression in the closed portion thereof, said armature member being provided with a spherical boss engaging the inside surface of said first impression and a pair of dogs flanking said boss, a flat spring secured at the ends thereof by said pair of dogs and provided with a second spherical

impression engaging the outside surface of said first impression, whereby said bridging member is maintained in juxtaposition with said operating arm and when said coil is energized with said bridging member tilted with respect to said poles said strap slides between said boss and said spring to allow the engaging surfaces of said bridging member to seat flatly upon the faces of said poles.

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