Feb. 20, 1934. J. F. FRESE 1,948,374

ALTERNATING CURRENT CONTACTOR

Filed June 26, 1933

FIG. 1.

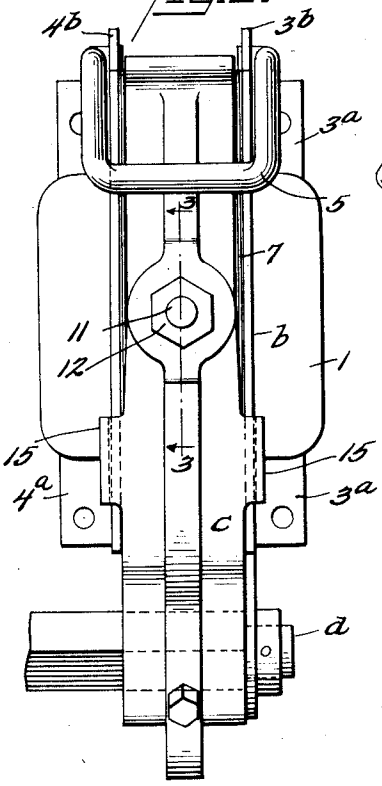


FIG. 2.

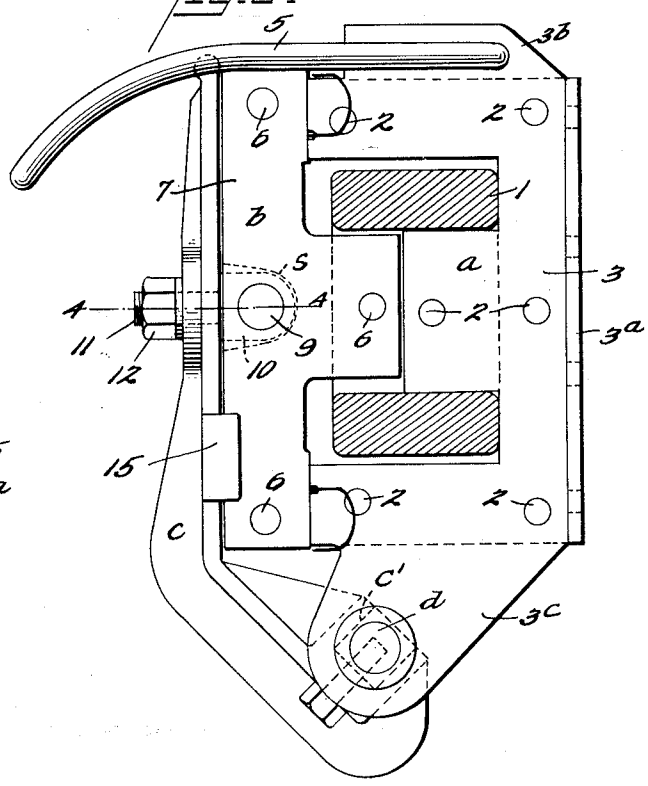


FIG. 3.

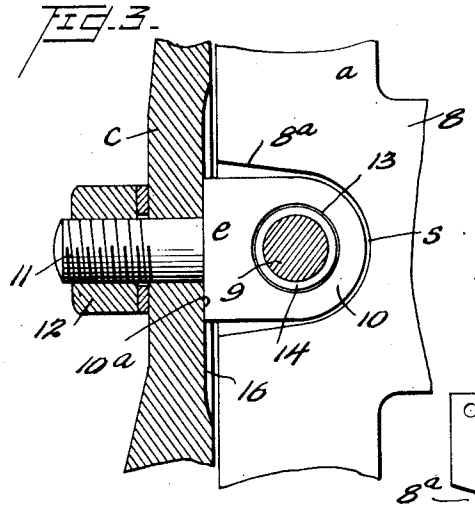


FIG. 4.

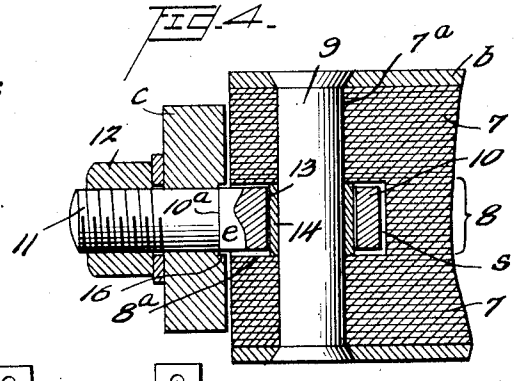
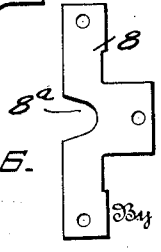


FIG. 6.



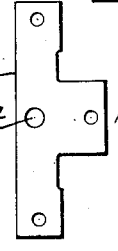


FIG. 5.

Inventor
Joseph F. Frese
By Robert Watson
Attorney

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ALTERNATING CURRENT CONTACTOR

Joseph F. Frese, Baltimore, Md., assignor to Monitor Controller Company, Baltimore, Md., a corporation of Maryland

Application June 26, 1933. Serial No. 677,748

2 Claims. (Cl. 175—338)

This invention relates to contactors for use on alternating current circuits, and more particularly to means for connecting the armature of the magnet to the arm which supports it so that the armature may have a limited universal movement with respect to the arm which is desirable in order that the armature may seat evenly against the pole-pieces of the magnet.

In carrying out the invention, the armature is built up of steel or iron plates which are alike in shape except for a group at the center of the armature, each plate in this group having a deep recess and the group, when assembled, providing a recess in the back of the armature about midway between its ends and sides. An eye-bolt, suitably secured to a pivoted arm, has a head which fits loosely in this recess, and a pin extends transversely through the armature and through this recess and the eye in the bolt. A sleeve surrounds the pin within the recess and serves as a distance piece to prevent the plates which form the side walls of the recess from being forced inwardly when the pin is being riveted or otherwise secured in place. The eye in the bolt is slightly larger in diameter than the outer diameter of the sleeve so that the armature may have a limited universal movement with respect to the supporting arm.

In the accompanying drawing,

Fig. 1 is a front elevation of the contactor;

Fig. 2 is a side elevation of the same, the energizing coil being shown in section;

Fig. 3 is a section on the line 3—3 of Fig. 1;

Fig. 4 is a section on the line 4—4 of Fig. 2;

Fig. 5 is a side elevation, on a smaller scale, of one of the plates composing the major portion of the armature, and,

Fig. 6 is a similar view of one of the plates composing the central part of the armature.

Referring to the drawing *a* indicates an E-shaped magnet core having an energizing coil 1 surrounding its central pole piece and *b* indicates the armature which is attached, in the manner hereinafter described, to an arm *c* of non-magnetic metal secured to a switch operating shaft *d*. The core of the magnet is composed of laminated steel plates, as usual in magnets energized by alternating currents, and rivet pins 2 secure the plates together. The side plates are thicker than the intermediate plates. One of these side plates, 3 shown in Fig. 2 has a flange 3^a, an upward extension 3^b and a downward extension 3^c. The side plate at the opposite side of the core is the same in all respects as the plate 3, except that it has not the downward extension. Only the flange 4^a and the upward extension 4^b of this opposed plate appear in the drawing. The flanges are provided with holes to receive screws or bolts by which the magnet may be attached to a switchboard; the upward extensions have bearings for a bail 5 and the lower extension 3^c of the plate 3 has an opening to receive one end of the shaft *d*. This shaft, in addition to carrying the arm *c*, carries switch arms, not shown, and is supported at its opposite end by a bearing, also not shown.

The shaft *d*, except at its bearing portions, is square in cross-section and the arm *c* has a square socket *c'* which fits onto the shaft like a wrench and is detachably connected to the shaft by a threaded bolt which passes through the arm and into the shaft.

The armature *b* is composed of laminated steel plates, all of the same size, secured together by rivet pins 6. The plates 7 composing the major portion of the armature are of the form shown in Figs. 2 and 5, each plate having a circular opening 7^a, about midway between its ends, to receive a rivet pin 9. Each plate 8, in a group at the center of the armature, has a recess 8^a in its rear edge through which the rivet pin extends. The recesses in the assembled plates form a deep socket *s* in the rear side of the armature, adapted to receive the head 10 of an eye-bolt *e* which has a threaded stem 11 extending through the arm *c*. A nut 12 on the stem clamps the head of the bolt against the arm. The head, as shown, has flat sides and fits freely within the socket. The head has an eye 13 through which the rivet pin 9 and a sleeve or collar 14, surrounding the pin, extend. In connecting the armature to the arm *c*, the sleeve is placed within the eye in the bolt and the head of the bolt is then inserted in the socket and the rivet pin is passed through the armature and the sleeve and riveted in place. The sleeve, which fits closely around the pin, is equal in length to the width of the socket and serves as a distance piece to prevent the plates at the sides of the socket from being forced inwardly when the pin is riveted over. The width of the head of the eye-bolt is somewhat less than the width of the socket, and the diameter of the eye 13 in the bolt is greater than the outer diameter of the sleeve, in order to permit the armature to rock freely to a limited extent about the axis of the rivet pin and also laterally, and in fact to have a universal movement with respect to the arm *c* so that the armature may always seat flatly

against the pole pieces. To hold the armature in alinement with the pole pieces of the magnet, flanges 15 may be provided on the arm *c*, these flanges extending at the sides of the armature but not closely engaging the same. The end 10^a of the head of the eye-bolt is at right angles to the axis of the bolt, and this end fits into a shallow longitudinal groove 16 in the arm *c*, which groove prevents the bolt from turning about its axis.

The bail 5 which is pivoted in the upward extensions of the side plates of the magnet core, as shown, serves as a stop for the arm *c* when the arm swings away from the magnet. The bail may be swung backward out of the way when it is desired to remove the arm from the shaft.

It will be evident from the foregoing description that the armature will have a limited universal movement with reference to the arm *c* which will permit the armature to seat evenly against the pole-pieces.

What I claim is:

1. A contactor comprising a magnet having a plurality of pole-pieces, a laminated armature adapted to engage the pole-pieces, said armature having a centrally located recess in its rear side and a pin extending transversely of the armature through the recess, a pivoted arm movable toward and from the magnet and a member secured to said arm and having a part loosely fitting within said recess, said part having an eye loosely surrounding said pin.

2. A contactor comprising a magnet having a plurality of pole-pieces, a laminated armature adapted to engage the pole-pieces, said armature having a centrally located recess in its rear side, a pin extending transversely of the armature through the recess and a sleeve on the pin having its ends abutting the opposite walls of the recess, a pivoted arm movable toward and from the magnet and a member secured to said arm and having a part loosely fitting within said recess, said part having an eye loosely surrounding said sleeve.

JOSEPH F. FRESE.