Nov. 10, 1931. E. L. BOWLES 1,831,092

CONDENSER

Filed March 16, 1925

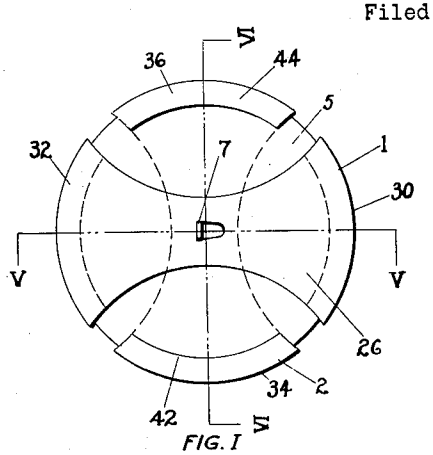


FIG. I

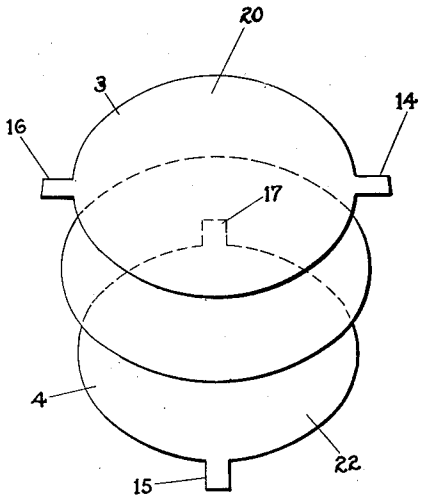


FIG. IV

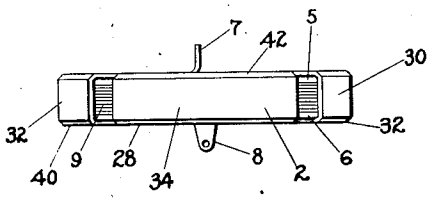


FIG. II

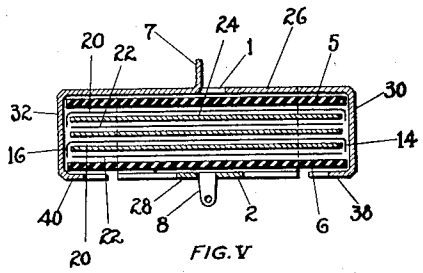


FIG. V

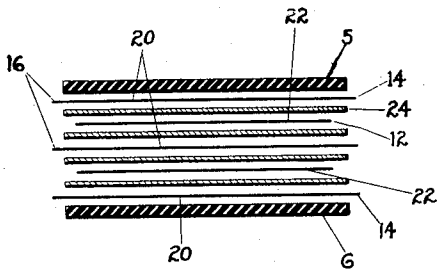


FIG. III

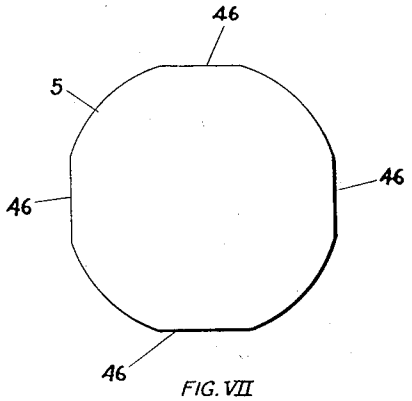


FIG. VII

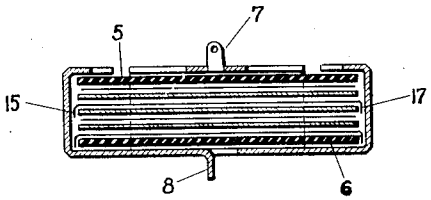


FIG. VI

INVENTOR
EDWARD L. BOWLES.
BY
David Rines
ATTORNEY

Patented Nov. 10, 1931 1,831,092

UNITED STATES PATENT OFFICE

EDWARD L. BOWLES, OF WATERTOWN, MASSACHUSETTS

CONDENSER

Application filed March 16, 1925. Serial No. 15,769.

The present invention relates to electric condensers, and more particularly to fixed condensers.

A chief object is to provide an improved fixed condenser that shall be easy and cheap to manufacture and very efficient in operation.

Further objects and advantages of the invention will be in part obvious and in part specifically mentioned in the description contained hereinafter.

In the accompanying drawings, Fig. I is a plan of a condenser constructed according to a preferred embodiment of the present invention; Fig. II is an elevation of the same; Fig. III is a diagrammatic view, in section, illustrating the preferred construction of a condenser manufactured according to the present invention; Fig. IV is a perspective view of several conducting and insulating sheets of a condenser arranged according to the preferred embodiment of the present invention; Fig. V is a diagrammatic section taken upon the line V—V of Fig. I, looking in the direction of the arrows; Fig. VI is a similar section taken upon the line VI—VI of Fig. I; and Fig. VII is a plan of a modified insulating plate.

The preferred condenser of the present invention comprises a stack of alternately disposed, thin, conducting sheets 20 and 22, like tinfoil, and thin insulating sheets 24, like mica. It is preferred to have the sheets disc-shaped, with the diameters of the insulating discs somewhat larger than the diameters of the conducting discs. The conducting sheets 20 are each provided with diametrically opposed lips 14 and 16, and the conducting sheets 22 are each provided with similar, oppositely disposed lips 15 and 17. The lips 14, 15, 16 and 17 project beyond the peripheries of the insulating sheets 24, as illustrated. The lips 14 of the group of sheets 20 are all disposed in alinement, as shown in Fig. V, and, naturally, so are the lips 16. The lips 15 and 17 of the group of sheets 22 are similarly alined, as shown in Fig. VI. The lined lips 14 are midway disposed between the lips 15 and 17, the lips 15 midway between the lips 14 and 16, and so on, the lips being staggered and separated from each other by substantially ninety-degree intervals. The conducting sheets of the group of sheets 20 alternate with the conducting sheets of the group of sheets 22. The stack of conducting and insulating sheets is disposed between two insulating, disc-shaped plates 5 and 6.

The stack and the plates 5 and 6 are disposed between two sheet-metal holders 1 and 2, each provided with a body portion 26 and 28, respectively, and two arcuate arms, indicated at 30, 32 and 34, 36, respectively, bent at right angles to the body portion. The body portion 26 is in engagement with the plate 5 and the body portion 28 in engagement with the plate 6. The arms 30 and 32 respectively contact with the lips 14 and 16, and the arms 34 and 36 with the lips 15 and 17. Electrical contact is thus established between each holder and the sheets 20 or 22, as the case may be, of one of the groups. The arm 30 is provided with an end portion 38 that is bent parallel to the body portion and pressed into intimate engagement with the plate 6 at a time when the stack is under pressure. The arm 32 is similarly provided with a similarly bent end portion 40 that is pressed into intimate engagement with the plate 6. The arms 34 and 36 are likewise provided with end portions 42 and 44 that are pressed into intimate contact with the plate 5. Each holder thus presses against both sides of the stack of sheets and interposed plates 5 and 6, effecting a firmer holding action. The holding action is increased by reason of the fact that the end portions of the arms are arcuate, which tends to prevent the end portions opening out easily when the above-mentioned pressure upon the stack is relieved. The holding pressure of the holders tends, therefore, to become equalized throughout the area of the condenser. A very compact, easily manufactured condenser is thus provided at small cost.

Electrical connection to the condenser may be made by means of terminals 7 and 8. These may consist of binding posts, projecting rods and the like, but it is preferred to make them of lugs that are struck or bent up out of the body portions of the holder. It is, of course,

essential to have the holders insulated from each other, and the insulating plates 5 and 6 fulfill this requirement admirably. They should be made relatively thick, so as to be stiff enough to transmit the pressure of the holders to the stack. If greater stiffening action is desired, metal plates may be used instead of the insulating plates 5 and 6, provided that insulating barriers are provided between them and the holders. To obviate any tendency of the holders slipping upon the stack, and thus possibly coming into contact with each other, one or both of the insulating plates 5 and 6 may be slightly flattened along their periphery, as shown at 46, Fig. VII, and the holders may be bent against the flattened portions. The flattened portions 46 may be provided by making four tangential cuts, ninety degrees apart, along the periphery of the plates.

It will be understood that the invention is not limited to the exact embodiments thereof that are illustrated and described herein, but that modifications may be made by persons skilled in the art without departing from its spirit and scope, as defined in the appended claim.

What is claimed is:

A condenser comprising a stack of alternately disposed disc-shaped conducting layers and insulating layers, the conducting layers each having oppositely disposed lips projecting beyond the insulating layers, the conducting layers being arranged in two groups with the lips of each group in alinement with each other and out of alinement with the lips of the other group, the conducting layers of each group alternating with the conducting layers of the other group, two conducting sheet-metal holders between which the stack is disposed, and two insulating disc-shaped members interposed between the stack and the holders, the holders each having a body portion in engagement with one of the members and two arcuate arms bent at right angles to the respective body portions along a substantial portion of the circumference of the condenser, each arcuate arm of each holder being between the two arcuate arms of the other holder along the circumference of the condenser, the bent-up arcuate arms of each holder contacting with the oppositely disposed lips of one of the groups, and the free ends of the bent-up arcuate arms being bent along the circumference of the condenser parallel to the body portion into tight engagement with the respective insulating members, whereby opening out or bending back of the bent-over arcuate arms is prevented by the curvilinear form into which the sheet-metal holders are bent, the holders being insulated from each other.

In testimony whereof, I have hereunto subscribed my name.

EDWARD L. BOWLES.