June 4, 1929. L. E. MENUT 1,715,560

ELECTRICAL CONDENSER

Filed Feb. 26, 1926

Fig. 1

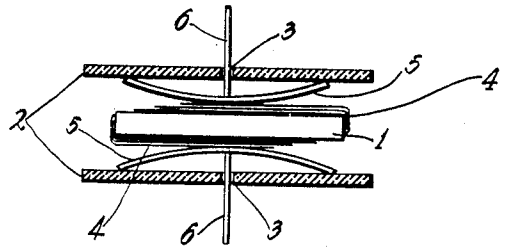



Fig. 2

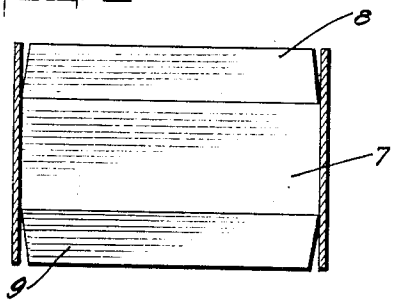



Fig. 3

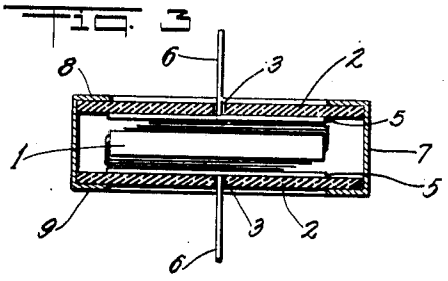
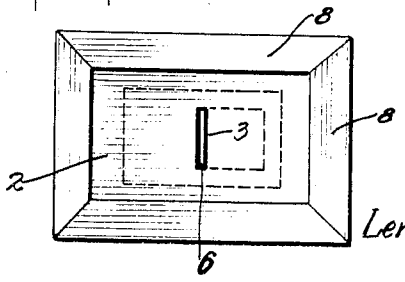



Fig. 4




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# UNITED STATES PATENT OFFICE.

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## ELECTRICAL CONDENSER.

Application filed February 26, 1926. Serial No. 90,875.

This invention relates to improvements in electrical condensers, and particularly to condensers of constant capacity, known as fixed condensers.

It is an object of this invention to provide a well housed condenser, the body or stack of which can be maintained in a state of compression to the required degree, and which may have its terminals projecting from opposite faces of the condenser.

To more clearly disclose the invention, I have shown a practical embodiment in the accompanying drawings. This is for the purpose of exemplification merely, and hence cetrain of the parts are illustrated diagrammatically. In these drawings:

Fig. 1 is a longitudinal section of the device with the clamping member omitted;

Fig. 2 is a similar section of the clamping or binding member;

Fig. 3 is a central longitudinal section of the assembled condenser;

Fig. 4 is a plan view thereof.

The device as shown in Fig. 1 comprises a stack 1 which is composed of a series of elements or sheets of conductive material, such as metal foil, separated by sheets or elements, such as mica. This stack may be of any desired construction in which there is presented at opposite ends, projecting conductive elements of opposite polarity.

The stack is adapted to be mounted between two insulating cover plates 2. The plates 2 are provided with elongated transverse apertures 3 for a purpose hereinafter to appear.

Between the stack and the plates 2 there are mounted bowed metal spring members 5. At the central portion of each member on its concave side there is provided a metal projection 6 conforming in cross sectional outline to the aperture 3. This member 5 may be a curved plate with the projection 6 cut or stamped out in the middle as shown by broken lines in Fig. 4, and bent at right angles to the plane of the plate or member 6 carrying it to go through the aperture 3 of the adjacent plate 2.

I have provided a clamping member having side walls 7 and top and bottom flanges 8 and 9. This member may have the form of a rectangular ring or frame and be stamped from one piece of metal, and it may be shaped otherwise than rectangular, according to the outline of the condenser. The top edges have notches cut out at the four corners, as clearly shown in Fig. 2, to form the flanges, and to enable the flanges 8 and 9 to be crimped over to form a channel-shaped annular binding and retaining member, that holds the plates 2 together with the stack 1 between them.

In assembling the unit, the terminal projection 6 of each member 5 is inserted through the aperture 3 of the adjacent cover-plate 2. By elongating this aperture transversely and by conforming the terminal 6 to its shape, suitable engagement between the two is assured; hence, any turning or twisting movement of either spring leaf or member 5 with relation to the other parts of the condenser is precluded. I conceive this to be a very important advantage, for it is well understood that but a slight stress on the thin sheets of foil of the stack 1 will disrupt it; and such a disruption might well render the whole condenser useless.

The stack comprises sheets of foil separated by sheets of mica or other insulation, the alternate sheets of foil being of opposite polarity. As indicated at 4, the ends of the two groups of sheets of foil of opposite polarity project, one group having their ends projecting from one extremity of the stack and folded down on one face of the stack, and the other group having their ends projecting from the opposite extremity and folded down on the opposite face.

In a similar manner the other leaf or member is mounted to have the other terminal 6 go through the second plate 2. Hence, when the plates and members 5 are placed against opposite faces of the stack, the terminals 6 will be connected to the two terminals or poles of the condenser. Then the condenser may be compressed by any suitable means. It will be observed that during this compression operation the center of the two members 5 are maintained at fixed points

and the members flattened out upon the ends 4 of the two groups of foils. The provision of a non-turning connection between each plate 2 and the projection 6 passing through it permits only a flexing movement of the adjacent member 5 and prevents a rotary and lateral movement, that might tear some of the ends 4 of the foils.

As the two plates 2 approach during this compression process, the only movement occurring between the parts is so limited to the plates 2 and the members 5 that the extensions or terminals 6 protrude through the apertures 3 and the ends of the members 5 slide along on the inner faces of the plates 2.

When the stack and members 5 have been compressed the desired extent, the clamping member is set or locked on the plates 2. This may be done in any desired manner. The upper flanges 8 may be first folded over at right angles to the side walls 7 and then fitted down upon the adjacent plate 2 and the bottom flange then crimped under the other plate to secure the stack under compression between the plates.

A condenser unit is now provided in which the stack is maintained under pressure exerted by the compressed spring members 5. Any slight release in the clamping action of the retaining member 7 has no appreciable effect on the degree of compression existing in the stack, since it acts thereon only indirectly.

It will be appreciated that I have utilized each projection to perform a plurality of useful functions. These projections are so constructed that they serve as a terminal for the unit, and also as guides for the members 5 carrying them. By reason of their particular shape and co-operation with the plates 2, they prevent twisting of the members 5 and thus prevent rupture of the ends of the foils projecting to be pressed upon by the members 5, at the same time they center the members 5 and obviate lateral movement of the members 5 with respect to the protruding ends 4 of the foils in the stack 1.

It will thus be seen that I have provided a compact and simple unit in which the number of parts have been reduced to a minimum, while the useful functions have been materially increased.

While I have shown and described a practical embodiment of my invention, it is to be understood that this is merely for purposes of exemplification for the essential features may be incorporated in other specific mechanical structures, hence I do not intend to be limited to the particular device herein shown except in so far as limitations to this structure appear in the sub-joined claims.

I claim:

1. A condenser comprising a stack, a pair of cover plates, a pair of resilient members mounted between the plates and the stack and a clamping member engaging the plates over their entire perimeter to maintain the resilient members under compression.

2. A condenser comprising a stack, a pair of cover plates for the stack having elongated apertures therein, spring members formed with projections, the spring members being interposed between the stack and the plates, said projections passing through the apertures.

3. A condenser comprising a pair of cover plates having elongated apertures therein, a pair of spring members adapted to co-act with the plates and provided with projections passing through the apertures, a stack interposed between the members, and means to maintain the members and stack under compression.

4. A condenser comprising a pair of apertured cover plates, a pair of spring members having portions extending through the plate to prevent lateral movement of said members, a stack interposed between the members and a clamping member engaging the plates to maintain the stack under compression.

5. A condenser comprising a stack, a pair of cover plates provided with oblong apertures, a spring member interposed between the stack and each plate, and provided with a projection passing through the apertures to prevent rotary and lateral movement of the spring member with respect to the cover plates.

6. A condenser comprising a stack, cover plates therefor, a clamp engaging the periphery of the plates, and terminals extending one through one plate and the other through the opposite plate.

7. A condenser comprising a stack, cover plates therefor, a clamp engaging the periphery of the plates, and terminals extending one through one plate and the other through the opposite plate, said terminals having bowed resilient members attached thereto, between the plates and the stack, to compress the stack.

8. A condenser comprising a stack, a cover plate for the stack, a resilient member mounted between the plate and the stack, and a clamping member engaging the plate around its perimeter and compressing the stack and the resilient member against the plate.

9. A condenser comprising a stack, a cover plate for the stack, a resilient member mounted between the plate and the stack, and a clamping member engaging the plate around its perimeter and compressing the stack and the resilient member against the plate, said resilient member having a portion projecting therefrom through the plate to enable the condenser to be connected to the extremity of an outside circuit.

10. A condenser comprising a stack, a cover plate for the stack, a resilient member mounted between the plate and the stack, and a clamping member engaging the plate around its perimeter and compressing the stack and the resilient member against the plate, said resilient member having a portion projecting through an aperture in the plate, said portion and said aperture being shaped to have interfitting engagement to prevent rotation of said resilient member between the stack and the plate.

In testimony whereof I affix my signature.

LEROY E. MENUT.