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J. A. FRIED

1,707,959

CONDENSER

Filed Oct. 12, 1923

Fig. 4.

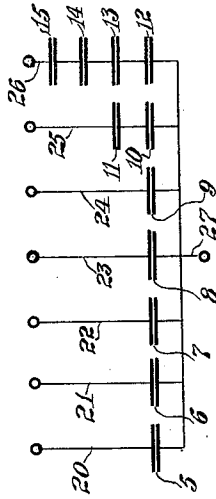


Fig. 1.

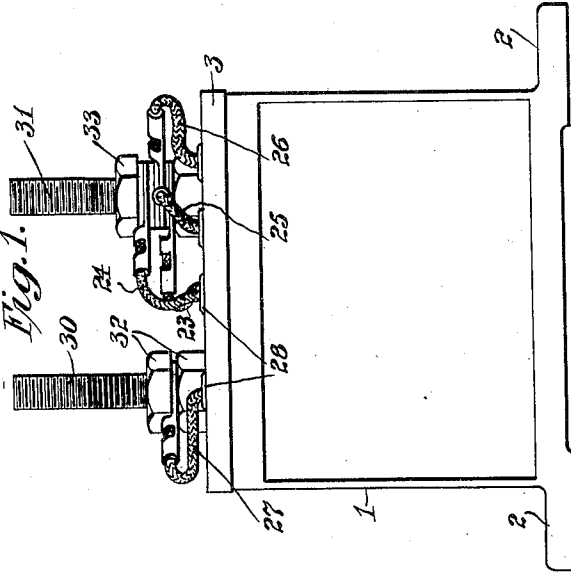


Fig. 3.

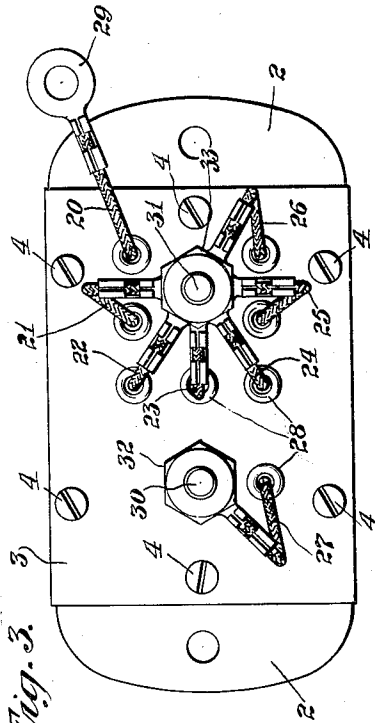
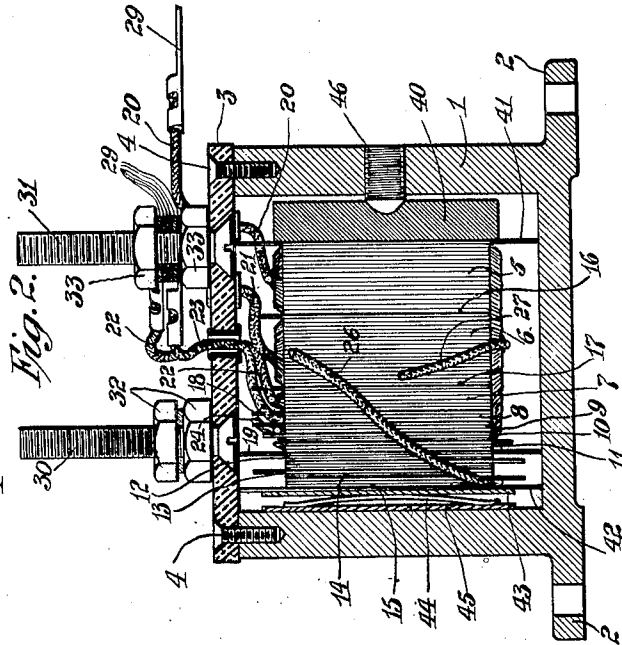


Fig. 2.



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CONDENSER.

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This invention relates to condensers and more particularly to variable condensers.

It is the object of the present invention to provide a variable condenser which is simple in construction and readily adjustable to various values, and one which is adapted for heavy duty such as is encountered in railway signaling, train control systems and the like.

With this object in view I have provided certain new and useful combinations of elements set forth in the following detailed description of one exemplification of a condenser structure, and defined in the appended claims.

The drawings represent a preferred embodiment of a condenser structure illustrating the various features of the present invention, Fig. 1 being a side elevation, Fig. 2 a vertical cross section, Fig. 3 a top plan view and Fig. 4 a schematic illustration of the circuit.

1 is a heavy casing of cast aluminum provided with perforated leg pieces 2 by means of which it may be attached to a panel. The casing 1 is covered by a panel 3 of insulating material fastened thereto by means of screws 4. A plurality of fixed condensers 5—15 are provided within the casing 1, each one being composed of alternate layers of insulating and conducting material such as sheets of mica and tin foil 16, 17, 18, 19, etc. Adjacent condensers may be of different values, the scale of such values being determined by the intended use of the device. The upper ends of the tin foils of condenser 5 are connected to a cord 20, the upper ends of tin foils in condenser 6 to cord 21. Similarly, one side of condensers 7, 8, 9, 10, 11, is connected with cords 22, 23, 24 and 25, and one end of the last condenser 15 is connected to cord 26. The lower ends of the tin foils in condenser 5—11 are connected to a cord 27. The cords pass through the cover 3 provided with suitable bushings 28 and terminate in eyelet shaped terminals 29 that fit over binding posts 30 and 31 projecting from the cover 3. The eyelets 29 may be held in place on the posts by means of nuts 32 and 33.

The pile-up of condensers is held on one side by a steel plate 40 and a mica plate 41 and on the other side by a mica plate 42 contacting with a steel plate 43. The steel plate 43 engages a relatively strong leaf spring 44 which in turn rests against a steel plate 45. The steel plate or member 40 may be engaged

by means of a screw-threaded lug or element 46 projecting through the casing 1. By driving home said screw the whole pile-up is compressed by the adjusting and holding means comprising the parts 40 and 46 to the required extent. If due to atmospheric and heat conditions the relative displacements of casing 1 and the condenser pile-up vary, then the resilient means or spring 44 which has been placed under tension will become operative to maintain the pile-up sufficiently compressed.

Referring now to Fig. 4, it will be seen that depending on the number of the conductors 20—24 that are interconnected through the binding post 31, a varying number of condensers of definite values will be connected in parallel, and through conductors 25 and 26 and 27 definite condenser values may be connected in series parallel relation to each other. In this manner a wide range of capacity variations may be effected without the necessity of providing too large a number of condenser units or complicated and sensitive mechanism.

The terminals 29 of conductor cords 20—26 that are not in use are slipped over the binding post 30. If such conductors were permitted to hang loose, they would be charged by the currents received and thus part of the energy dissipated. By connecting them all to the binding post 30 and therefore with conductor 27 to which the opposite sides of all condenser units are connected, a dead short circuit is formed.

What I claim is:

1. In a variable condenser, a casing, a plurality of fixed condensers of different values within said casing, each condenser being composed of sheets of conducting and insulating materials, a cover for said casing, terminal posts projecting from said cover, a plurality of apertures in said cover, flexible conductors projecting through said apertures and each connected to one side of the conducting sheets of certain of said condensers, a separate conductor projecting through an aperture and connected to the other side of the conducting sheets of a plurality of said condensers, and connectors at the ends of said conductors, the conductors being adapted for connection with any of said binding posts, whereby the value of the condenser unit may be varied.

2. In a variable condenser, a casing, a plurality of fixed condensers within said casing,

each condenser being composed of conducting and insulating material, a plurality of conductors each connected to one side of the conducting sheets of certain of said condensers, a separate conductor connected to the other side of the conducting sheets of a plurality of said condensers, binding posts, and connectors at the ends of said conductors adapted for engagement with said binding posts, the conductors being adapted for connection with any of the binding posts.

3. In a variable condenser, a casing, a plurality of fixed condensers within said casing, each condenser being composed of sheets of conducting and insulating material, two plates between which said condensers are held, a spring between one of said plates and a wall of said casing, means operable outside of said casing for adjusting the distance between the opposite wall of said casing and the other plate, a plurality of conductors, each connected to one side of the conducting sheets of certain condensers, a separate conductor connected to the other side of the conducting sheets of a plurality of said condensers, two binding posts, and connectors at the ends of said conductors adapted for engagement with said binding posts, the conductors being adapted for connection with either of the binding posts.

4. In a variable condenser, a casing, a plurality of fixed condensers of different values

within said casing, each condenser being composed of sheets of conducting and insulating material, two plates between which said condensers are held, a leaf spring between one of said plates and a wall of said casing, a screw-threaded lug projecting through the opposite wall of said casing engaging the other plate, a cover for said casing, two terminal posts projecting from said cover, a plurality of apertures in said cover, conductors projecting through said apertures and each connected to one side of the conducting sheets of certain but not all of said condensers, a separate conductor projecting through an aperture and connected to the other side of the conducting sheets of a plurality of said condensers, and connectors at the ends of said conductors adapted for engagement with said binding posts, the conductors being adapted for connection with either of the binding posts.

5. In a condenser, a casing having binding posts thereon, a plurality of fixed condensers within the casing, a plurality of conductors extending through the casing, one end of each conductor being connected to certain of the condensers, the other end of each conductor being adapted for connection with any of the said binding posts whereby any desired capacity may be obtained.

In testimony whereof I affix my signature.
JOSEPH A. FRIED.