

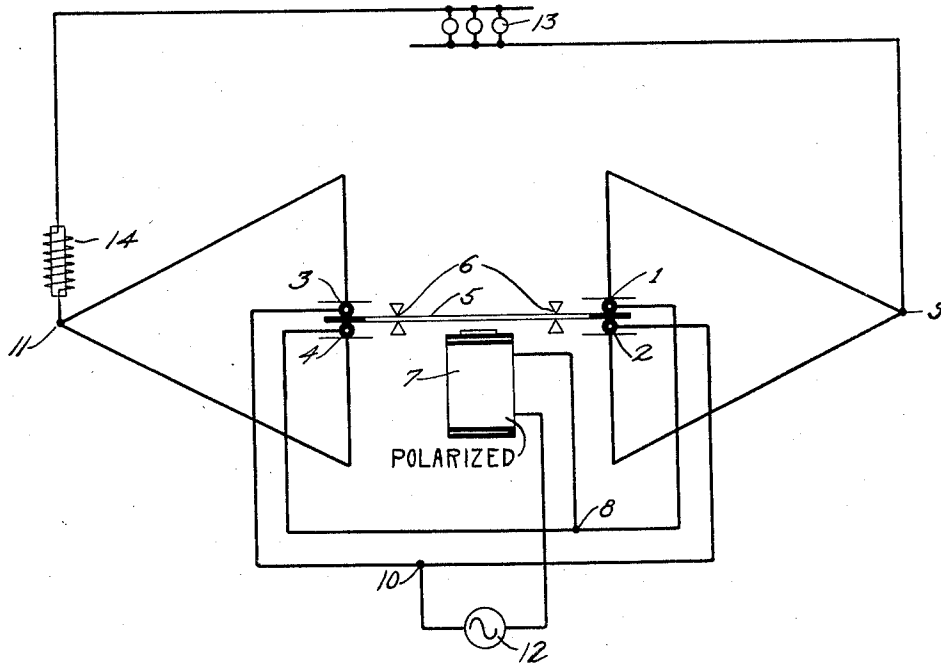
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ALTERNATING CURRENT RECTIFIER

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UNITED STATES PATENT OFFICE

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ALTERNATING-CURRENT RECTIFIER

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This invention relates to alternating current rectifiers.

Its object is to provide a simple, compact and inexpensive device for rectifying alternating currents of small magnitude.

The invention consists in providing a Wheatstone bridge with four microphones, such as carbon buttons, one button in each of the legs of the bridge, these buttons being expanded and compressed alternately in pairs, the actuating means being driven by the alternating current to be rectified, which current also supplies the energy to the bridge, the unidirectional current being obtained in the conjugate path.

This invention will be more clearly understood from the following description taken in connection with the attached drawing forming a part of the description.

In the drawing the figure represents one embodiment of the invention wherein a polarized electromagnet actuates a rod supported at two points in such a way as to vibrate free of harmonics.

Referring to the figure microphone elements 1, 2, 3 and 4 are situated with respect to the vibrating rod 5 so that with the rod in one position elements 1 and 3 will be compressed and elements 2 and 4 expanded and in the other position of the rod, elements 2 and 4 will be compressed and 1 and 3 expanded.

Rod 5 is supported and held in position by means of knife edges 6 placed in such a position that rod 5 under the action of polarized electromagnet 7 will vibrate free of harmonics. Assuming the length of the rod 5 to be represented by L , knife edges 6 should be placed $.224 L$ from each end of the rod. It has been found that the rod so supported will then vibrate free of harmonics.

The microphone elements are connected electrically so that they each form a leg of a Wheatstone bridge, element 1 being in the leg 8, 9, element 2 in the leg 9, 10, element 3 in the leg 10, 11, and element 4 in the leg 11, 8.

An alternating current source is indicated at 12, which is applied to the bridge arrangement through electromagnet 7 at junction

points 8 and 10 of the bridge while the load 13 through which the unidirectional or rectified current is to pass is connected at points 9 and 11.

Assume a current pulsation to pass from source 12 through magnet 7. At 8 this current divides, part passing through microphone element 1 to point 9, the other part passing through element 4 to point 11. Assuming that, with the rod 5 in the unoperated position, the resistance of the microphone elements is equal, no part of the current will pass from 9 to 11 through load 13, as the potential at these two points will be equal. The one part of the current will therefore pass from point 9 through element 2 to point 10, the other part of the current passing from 11 through element 3 also to point 10. At point 10 both parts join and return to the source 12.

However, as soon as this current is impressed on magnet 7 it will actuate rod 5. Assume that rod 5 is so actuated as to compress elements 1 and 3 and expand elements 2 and 4. The path of this current may now be traced after leaving the magnet to point 8 through element 1 which now provides a low resistance path, to point 9, through load 13, choke coil 14, point 11, element 3, also compressed, point 10, so back to the source 12. Upon the reversal of the current magnet 7 will repel the armature of rod 5 thereby expanding the elements 1 and 3 and compressing elements 2 and 4 and the current in this case may be traced from the source 12 to point 10, through element 2, to point 9, through load 13, choke coil 14, to point 11, through element 4 to point 8, through magnet 7, back to the current source 12.

It will thus be seen that the current through the load 13 always passes in the same direction no matter what the direction of the current from the source 12.

What is claimed is:

An alternating current rectifier comprising a Wheatstone bridge, a microphone element in each leg, a vibrating bar adapted to compress and expand said elements alternately and in pairs, means for supporting

said bar to enable it to vibrate free of harmonics, an alternating current to be rectified, and means to cause said bar to vibrate in synchronism with the current reversals in said alternating current.

5 In witness whereof, I hereunto subscribe my name this 26th day of June, A. D. 1925.
CHARLES R. MOORE.

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