

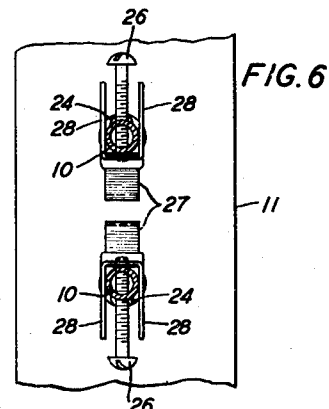
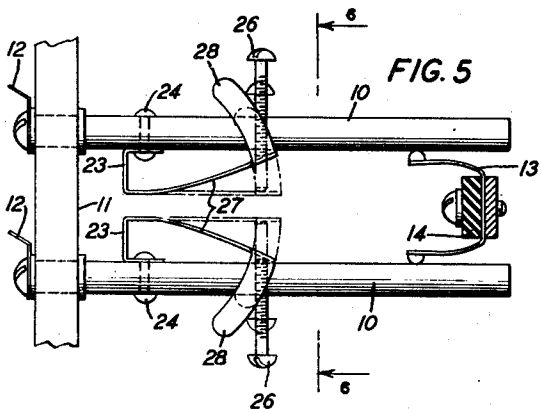
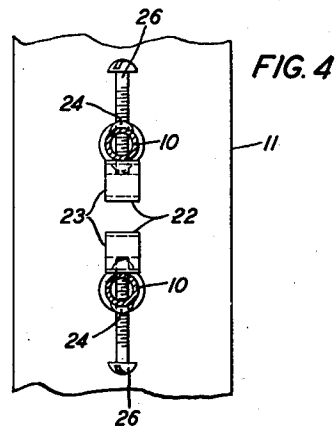
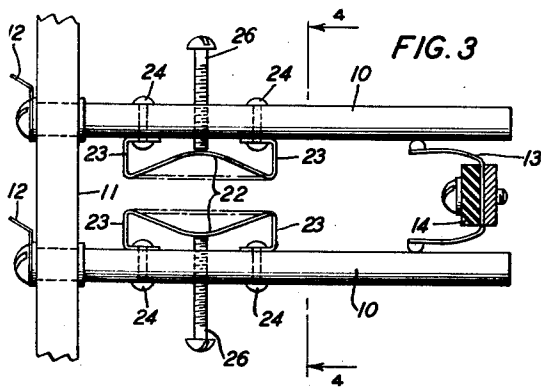
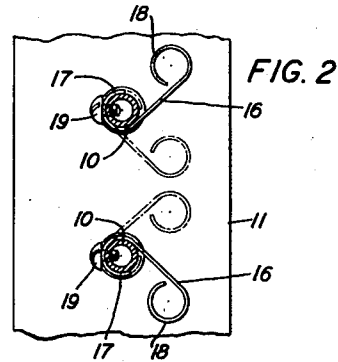
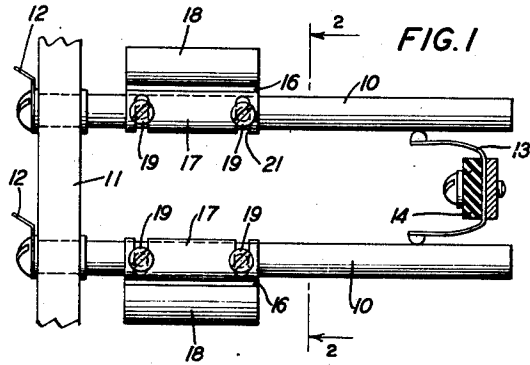
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2,475,198

TUNABLE LECHER CIRCUIT

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TUNABLE LECHER CIRCUIT

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1 Claim. (Cl. 178—44)

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This invention relates to Lecher circuits and more particularly to means for trimming a tunable Lecher circuit.

An object of the invention is to trim a Lecher circuit. Another object is to trim a tunable Lecher circuit without shortening the length of line required for a given resonant frequency.

A tunable Lecher circuit comprises a pair of electrical conductors arranged physically in parallel and adjustable means for connecting a low impedance path between the conductors at a point which will tune the circuit at a desired frequency. Often it is required to trim such a circuit, that is, to change its stiffness, or the slope of the reactance-frequency characteristic as it passes through the resonance point. Trimming may be required, for example, when a number of tunable Lecher circuits are under a unitary control and it is desired that at each setting of the control all of the circuits be tuned to the same frequency.

Trimmers heretofore used such, for example, as variable capacitors or inductors shorten the physical length of line required for a given resonant frequency. As a result, the power transferring capacity of the circuit is reduced, the maximum resonant frequency is lowered, and the tuning is made more critical.

The trimmers in accordance with the present invention avoid these undesired results by introducing both inductance and capacitance in such a way that the line is not shortened but may, in fact, be lengthened. The trimmer comprises a longitudinal conducting element electrically connected at its ends to spaced points on one of the conductors of the Lecher circuit and means for adjusting the distance between the element and the other conductor. To increase the range of adjustment a second element may be associated with the other conductor, preferably opposite the first element.

In one embodiment the conducting element comprises a sheet of metal with one edge rolled over to fit snugly around the conductor. The opposite edge, also, is preferably rolled over to avoid a sharp projection. Adjustment is made by swinging the element about the conductor. In another form the element is a strip of spring metal with legs at the ends electrically connected to one conductor so that the element projects toward the other conductor. Adjustment is made by moving the center of the element toward or away from the conductor as, for example, by means of a screw. A third form is similar to the one just described except that it is attached to

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the conductor at one end only and is adjusted at the other end.

The nature of the invention will be more fully understood from the following detailed description and by reference to the accompanying drawing in which like reference characters refer to similar or corresponding parts, and in which:

Fig. 1 is a plan view of a tunable Lecher circuit with a trimmer in accordance with the invention employing rotatable elements;

Fig. 2 is a cross-sectional view of the structure of Fig. 1 taken at the line 2—2;

Figs. 3 and 4 are similar views of a different form in which the elements are of the spring type attached at both ends and adjusted at the center; and

Figs. 5 and 6 are similar views showing modified spring type elements attached at only one end and adjusted at the other end.

The Lecher circuit shown in Figs. 1 and 2 comprises a parallel pair of tubular conductors 10 attached at their left ends to an insulating support 11 and provided with terminals 12. A contact bridge 13 supported by an arm 14 may be moved along the conductors 10 to the proper position to tune the circuit to the desired frequency.

The trimmer comprises a longitudinal conducting element 16 electrically connected at its ends, at least, to two spaced points on one of the conductors 10. As shown, the element 16 comprises a sheet of metal with one edge 17 rolled over to fit snugly around the conductor 10 and also, preferably, with the opposite edge 18 rolled over so it will not be so sharp. The element 16 is adjusted by swinging it about the conductor 10 to increase or decrease the distance between the element 16 and the other conductor 10. The element 16 is locked in the desired position by means of the screws 19 which are positioned in transverse slots 21 in the element 16 and screw into tapped holes in the conductor 10. In order to increase the range of adjustment a second element 16 may be associated with the other conductor 10, preferably positioned opposite the first element 16. Fig. 2 shows in solid line the elements 16 positioned for approximately minimum effect, and in broken line the position for approximately maximum effect.

Figs. 3 and 4 show another form of the trimmer in which the longitudinal conducting element comprises a strip of spring metal 22 with legs 23 at the ends which are electrically connected to one of the conductors 10 by the rivets 24 so that the element projects toward the other conductor 10. The strip 22 is set so that it bows

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inwardly toward the conductor 10. Adjustment is made by means of a screw 26 which passes through tapped holes in the conductor 10 and bears upon the strip 22 at its center. In Fig. 3 the strip 22 is shown in full line as it approaches the minimum position and in broken line as it approaches the maximum position.

Figs. 5 and 6 show a modification of the trimmer of Figs. 3 and 4 in which a strip of spring metal 27 is attached to the conductor 10 at the left end only and is adjusted at the right end by means of the screw 26. To assure a good electrical connection at its right end the strip 27 has a pair of conducting arms 28 which grip the sides of the conductor 10. In Fig. 5 the strip 27 and the arms 28 are shown in full line in the minimum position and in broken line as the maximum position is approached.

In all of the trimmers shown, bringing the adjustable parts 16, 22 or 27 closer together, or closer to the other conductor 10, increases the frequency for any particular setting of the contact bridge 13. Of course, moving them farther apart has the opposite effect.

What is claimed is:

A tunable Lecher circuit comprising a pair of parallel tubular conductors, two oppositely positioned sheets of metal associated, respec-

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tively, with said conductors, and an adjustable contact bridge connecting said conductors, each of said sheets having one edge rolled over to fit around the associated conductor in such a way that the sheet may be swung about the associated conductor as an axis to adjust the distance between said sheets, each of said sheets including means for locking it in its adjusted position comprising a pair of transverse slots near the ends of said roller-over portion and a pair of screws which pass through said slots and screw into tapped holes in the associated conductor, and each of said sheets having its opposite edge also rolled over.

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