Oct. 24, 1933. M. PARISI 1,931,737

ELECTRON TUBE WITH ELECTROMAGNETIC GRID CONTROL

Filed July 9, 1931

Fig. 1

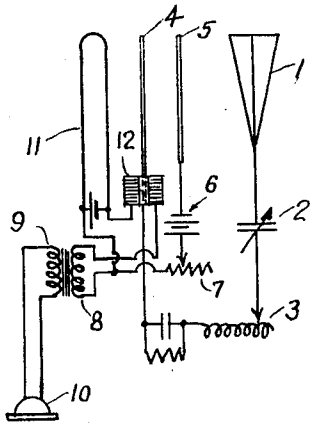



Fig. 2

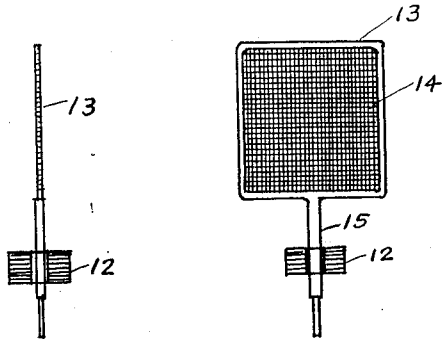
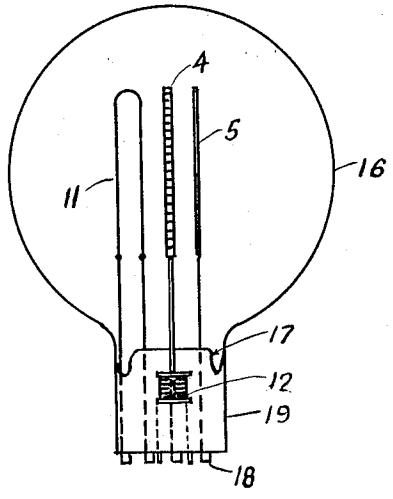



Fig. 3




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# UNITED STATES PATENT OFFICE

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## ELECTRON TUBE WITH ELECTROMAGNETIC GRID CONTROL

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2 Claims. (Cl. 250—27.5)

This invention relates to electronic tubes, such as used in the radio transmission of intelligence. The principal object of this invention is to provide a tube whose volume of electron flow could be variated by an electromagnetic field influence—regulated by external means—either for the purpose of increasing or improving the tune qualities of such a device. In order to accomplish this I have devised to place between the cold and hot electrodes of a radio tube, an electromagnetic electrode of suitable material possessing high magnetic permeability. This element is permanently magnetized, and is provided with means to increase or decrease its magnetization, accordingly. In order to render clear the working of my invention, I have attached the following drawing, in which Fig. 1 is a diagrammatical view of the apparatus, showing the wiring. Fig. 2 indicates the electromagnetic element of the apparatus shown in plan and side views. Fig. 3 is an assembly of the tube.

Referring to Fig. 1 numeral (5) indicates the cold electrode, and (11) the hot electrode of an electronic tube. In the space separating them, I place an electrode 4 possessing a magnetic field said field being variable by the winding of coil (12) which is shown in series with plate battery (6).

The aerial (1) is tuned with a variable condenser (2) and a slide wire tuning coil (3) and may be directly or otherwise connected with the magnetic element of the tube. The battery (6) of the plate element is connected with a resistance (7) and includes in its circuit the primary of a telephone transformer (8) and is in series with the hot element of the tube (11). The other end of said element being in series with the winding of coil (12). The secondary of the transformer (9) includes a sound detecting device, as a telephone receiver (10). When electromagnetic waves, coming on the aerial (1) will pass through element (4), they will cause a disturbance in the flow of electrons, and move more or less current from battery (6) to play into the circuit. This current in passing through winding (12) will tend to either overmagnetize or demagnetize the element (4) with the result of a synchronized effect, between the waves coming through space and the local circuit in resonance. As a result of this method, the tube will respond faithfully to speech reproduction, or tonal qualities. In Fig. 2 I have indicated mechanical details of this magnetic element. Numeral (13) indicates a square frame of cobalt steel, to which is attached or welded a fine mesh of wires (14) of same material. Frame (13) is provided with an extension (15) serving as the core of coil (12). This coil of fine wires, might have a resistance of about two hundred ohms. I prefer to place said coil in the base of the tube, outside of the glass bulb, but it could be designed to work inside of the glass bulb as well. In Fig. 3 is shown the assembly of the tube, with my magnetic element. I have indicated the coil (12) in the base of the apparatus. Numeral (16) is the glass bulb, and (17) is a glass seal, (19) is an insulating base, (18) are the terminals of the apparatus. It should be understood that the diagrams indicated do not show dimensions, and are preliminary data for using my device as a wave detector only. It should be understood, that the same principle can be applied for amplifying apparatus or for transmitting tubes.

Having thus described my invention, what I claim is:

1. A valve for radio reception comprising filament and plate electrodes and a grid electrode disposed therebetween, said grid electrode having a rigid extension, a coil disposed around said rigid extension, said extension serving as a core for the coil, the coil having independent terminals.

2. A valve for radio reception comprising filament and plate electrodes and a grid electrode disposed therebetween, said grid electrode comprising a rigid frame of cobalt steel carrying a fine wire mesh, said grid having a rigid extension integral therewith, a coil disposed on and around said extension, thereby to permit the extension to serve as a core therefor.

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