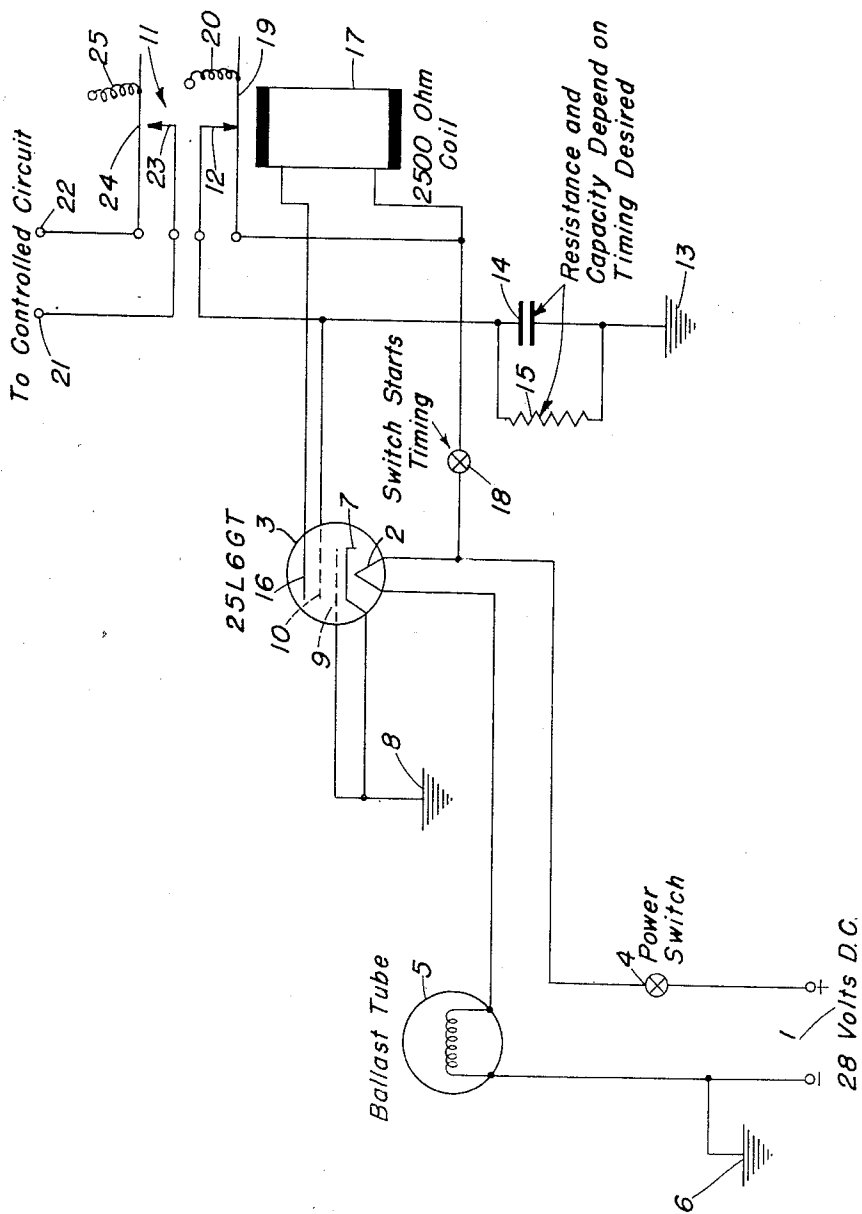


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ELECTRONIC TIMING DEVICE

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ELECTRONIC TIMING DEVICE

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5 Claims. (Cl. 250-27)

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This invention relates to timed pulse generators of the electronic type.

The purpose of the invention is to provide means for generating timed electronic impulses with an accuracy of five per cent or less. It can be used for photo-timers or for any other timing operation.

The figure of the drawing is a wiring diagram of my invention.

Reference numeral 1 indicates a source of direct current such as a battery. Heater filament 2 of tetrode 3 is electrically connected across battery 1, and has a power switch 4 and a ballast tube 5 connected in series with said filament 2 and the battery. Ballast tube 5 provides a constant current for the circuits. The filament return is grounded at 6. The cathode 7 return is connected to the negative side of the battery through ground 8. The control grid 9 is likewise grounded at 8 through the cathode return. Screen grid 10 has one lead connected to fixed contact 12 of make-and-break relay 11, and has another lead connected to ground 13 through resistance 15. Capacitor 14 is connected in parallel across resistor 15. Capacitor 14 and resistor 15 comprise a timing or time constant circuit. The plate 16 of tetrode 3 is connected to the positive side of the battery through relay coil 17, timer starting switch 18, and power switch 4, in series. Armature 19 is electrically connected to the positive terminal of the battery 1 through the switches 18 and 4, and is normally held closed by means of tension spring 20. Controlled circuit terminals 21 and 22 are connected to relay contact 23 and to relay armature 24, respectively. Armature 24 is normally urged open by spring 25. Relay armatures 19 and 24 coact in their engagement with fixed contacts 12 and 23, respectively.

Operation

The power switch 4 is turned on, and about 45 seconds are allowed to lapse so that the filament 2 can come up to operating temperature. Then the timer starting switch 18 is turned on to allow plate current to flow through the relay coil 17, and the screen grid current to flow to the timing circuit. When the switch 18 is closed, it closes the plate circuit and screen grid circuit, thereby energizing said plate 16 and said screen grid 10 with positive potential. The screen grid circuit is energized through normally closed armature 19, and the capacitor 14 is charged instantly. Since the plate is simultaneously energized, the tube conducts and energizes relay coil 17. Current through the plate circuit and relay coil 17 subse-

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quently opens armature 19, and simultaneously closes armature 24. Thereupon, the discharge from capacitor 14 maintains the screen grid energized and the tube in conducting condition, thereby holding armature 19 open and 24 closed. The controlled circuit is held closed for a time interval determined by the time constant of the timing circuit. Accordingly, as the capacitor 14 continues to discharge, the bias on the screen grid becomes less and less positive, resulting in less and less plate current. When the plate current is reduced to a "drop-out" value, armature 24 is released to an open position and armature 19 is allowed to regain its normally closed position. At this instant the controlled circuit is opened and immediately thereafter the cycle repeats itself.

While I have shown a particular embodiment of my invention, it will be understood, of course, that I do not wish to be limited thereto, since many modifications may be made, and I, therefore, contemplate by the appended claims to cover any such modifications as fall within the true spirit and scope of my invention.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

What is claimed is:

1. An electronic timing device, comprising: a tetrode having a plate, cathode, control grid, screen grid and heating filament; a D. C. power supply connected across said heating filament, said cathode and control grid connected to the negative terminal of said power supply, and said plate connected to the positive terminal of said power supply; constant-current means connected in said heater circuit; a power switch connected in said heater circuit; a make-and-break relay having a relay coil connected in series with said plate, an armature connected to the positive terminal of said power supply and a cooperating fixed contact connected to said screen grid; a starting switch connected in said plate circuit; and a resistance-capacitor timing circuit connected across said screen grid and said cathode, adapted to continue a charge on said screen grid for a predetermined time interval after the power supply is removed therefrom.

2. An electronic timing device, comprising: a vacuum tube having a cathode, plate, control grid, screen grid, and heating filament; a power supply connected across said heating filament, said cathode and control grid connected to the negative terminal of said power supply, and said

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plate connected to the positive terminal of said power supply; a make-and-break relay having a relay coil connected in series with said plate, an armature connected to the positive terminal of said power supply and a cooperating fixed contact connected to said screen grid, and a timing circuit connected across said screen grid and said cathode, adapted to continue a conducting charge on said screen grid for a predetermined time interval after the power supply is removed therefrom.

3. An electronic timing device, comprising a vacuum tube having at least a cathode, a plate, a control grid and a screen grid, a power source having a positive terminal, a relay having a coil connected in series with said plate and said positive terminal, said relay having a pair of normally closed contacts connected in series with said screen and said positive terminal means for maintaining said control grid at a fixed potential, and a time constant circuit connected across said cathode and said screen grid for continuing the conductivity of the tube for a predetermined interval of time after said closed contacts are opened.

4. An electronic timing device comprising a vacuum tube having a cathode, plate, control grid and a screen grid, a power source having positive and negative terminals, said cathode and control grid being connected to said negative terminal, a relay having a coil connected in series with said plate and said positive terminal, said relay having a pair of normally closed contacts connected in series with said screen grid and said positive terminal, and a time constant circuit connected across said cathode and said

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screen grid for continuing the conductivity of the tube for a predetermined interval of time after said closed contacts are opened by energization of said coil.

5. An electronic timing device comprising an electronic tube having a cathode, a plate, a control grid and a screen grid, means for maintaining said control grid at a fixed potential with respect to said cathode, a power source having a positive terminal, a relay having a coil connected in series with said plate and said positive terminal, said relay having a pair of normally closed contacts connected in series with said screen grid and said positive terminal, and a time constant circuit connected across said cathode and said screen grid for continuing the conductivity of the tube for a predetermined interval of time after said closed contacts are opened by energization of said coil.

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