

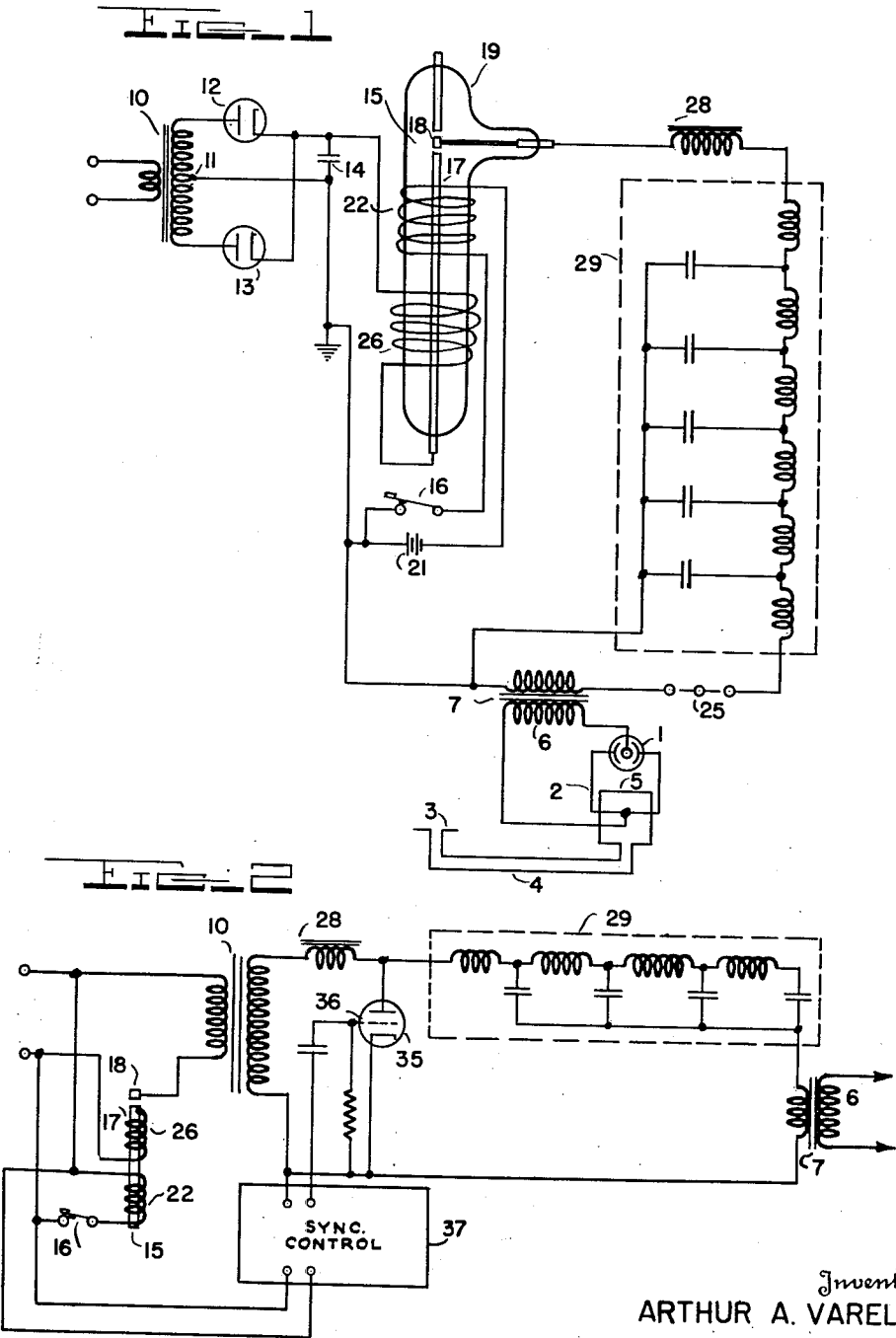
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IMPULSE GROUP KEYING SYSTEM

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IMPULSE GROUP KEYING SYSTEM

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3 Claims. (Cl. 320—1)

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This invention relates to the operation of radar systems and is particularly directed to the problem of generating a controlled series of transmitted impulses. Such operation, in distinction to continuous impulse generation, affords comparative security from detection and direction finding operations.

It is accordingly an object of the invention to provide means for radiating a series of high frequency impulses. It is a more specific object of the invention to provide means for terminating operation of a high frequency impulse transmitter.

The invention will be further described with reference to the drawings, in which:

Fig. 1 shows a high frequency transmitter incorporating the invention, and

Fig. 2 shows another embodiment of the invention.

In Fig. 1 a high frequency transmitter is shown comprising split anode magnetron 1 and tank circuit 2 feeding antenna 3 by line 4 coupled to the tank through loop 5. The transmitter is energized periodically by impulse voltages developed in secondary 6 of transformer 7 by a supply system fed from an alternating current source.

The power circuit may be connected across the primary of supply transformer 10, whose center tapped secondary 11 is connected in a full wave rectifying network having as filter components, condenser 14 and choke 23, and charges artificial line 29 through relay 15.

The charging of line 29 is controlled by relay 15 operated magnetically from control key 16. Relay 15 includes stationary electrode 17 and magnetically responsive armature 18. As shown, the relay structure is enclosed in an evacuated envelope 19.

Key 16 operates to close an auxiliary circuit including source 21 and coil 22 which when energized brings armature 18 into contact with electrode 17 to connect artificial line 29 to the power supply and cause periodic operation of the transmitter under control of rotary gap 25, which is synchronized with the power supply frequency to effect discharge on each alternation thereof. In order to maintain proper timing relations, gap 25 is continuously running and due to the inertia of its mechanical drive system may not be keyed in parallel with transmitter power supply.

The charging circuit includes, in series, winding 26 on relay 15 which also establishes a field controlling armature 18 and operates to maintain relay contact closed during the charging period of line 29.

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The artificial line draws a charging current on each half cycle of the rectifier network and is discharged before the succeeding half cycle by gap 25.

Termination of the transmitted impulse group by opening of key 16 cannot result in an inchoate transmitted impulse since charging of line 29 once inaugurated, is maintained until completion. By the invention excessive arcing of the relay contacts is also avoided, as these cannot be opened while passing a substantial current.

In the circuit of Fig. 2 relay 15 is positioned in the primary circuit of power transformer 19 which directly energizes artificial line 29 through charging choke 28. Line 29 therefore is alternately charged positively and negatively. Impulse discharge is obtained by operation of vacuum tube 35, which may contain a small amount of gas. Upon conduction of tube 35 under application of a control voltage applied to grid 36 from a suitable synchronizing control device 37, the line discharges through transformer 7 whose secondary 6 feeds an impulse transmitter as shown in Fig. 1. During such discharge the secondary of transformer 10 is blocked by charging choke 28.

It will be understood that the control pulse establishing conduction in switching tube 35 will be synchronized with the positive alternations charging line 29 by operation of the control device 37 energized by the alternating power supply voltage.

As in Fig. 1, the operation of relay 15 is effective to maintain the charging current after opening of key 16 until the line current falls to an inconsequential value. Consequently incomplete charging of line 29 will not occur to produce the generation of an inchoate transmitted impulse.

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.

I claim:

1. An impulse group keying system for radio transmitters comprising condenser means for storing energy, means for discharging the condenser means and feeding the stored energy to a transmitter, a power supply circuit for charging the condenser means, switch means in said circuit, and control means for said switch energized in series with the charging circuit to maintain the switch closed while the condenser means is drawing substantial current.

2. An impulse group keying system for radio transmitters comprising condenser means for storing energy, constantly running switch means

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periodically operative to connect the condenser means to a transmitter, circuit means for supplying current to the condenser means, a pair of normally open switch contacts in said circuit, contact control means for closing said contacts at will, and other contact control means for closing said contacts electrically operated and connected for energization by the charging current, by virtue of such connection the said other control means is rendered operative in dependency on the charging current to maintain the switch means closed while the condenser means is drawing substantial current.

3. An impulse group keying system for radio transmitters comprising condenser means for storing energy, constantly running switch means periodically operative to connect the condenser means to a transmitter, a power supply circuit for charging the condenser means, normally open me-

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chanical switching means in said circuit, and electromagnetic holding means for said mechanical switching means energized in series in said supply circuit.

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