

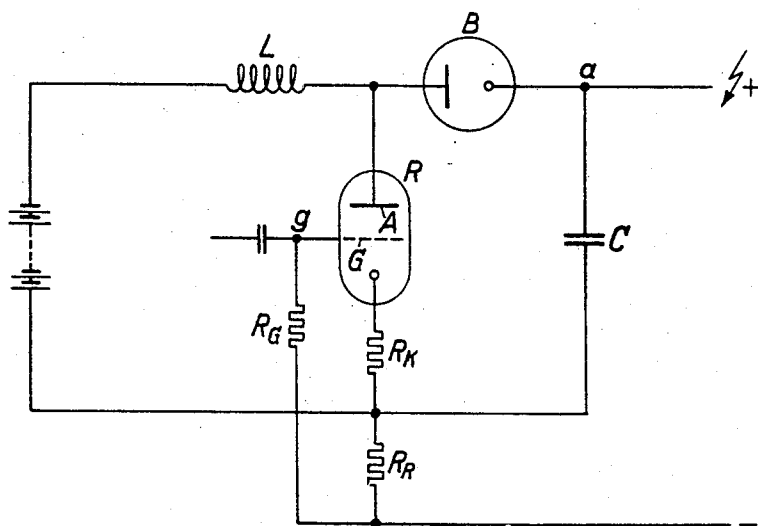
Sept. 29, 1942.

J. PRAST

2,297,498

POWER SUPPLY SYSTEM

Filed June 8, 1940



Inventor:
Johannes Prast

by
E. D. Phinney
Att'y

UNITED STATES PATENT OFFICE

2,297,498

POWER SUPPLY SYSTEM

Johannes Prast, Berlin, Germany; vested in the
Alien Property CustodianApplication June 8, 1940, Serial No. 339,479
In Germany June 26, 1939

2 Claims. (Cl. 171-97)

Cathode ray tubes, especially when employed in television apparatus, require their anode voltage to be produced with the aid of means that should be simple in construction. The arrangement may be such that the anode direct voltage for the cathode ray tube, such as a Braun tube, is obtained from those high frequency impulse voltages which are present in the system, such as a television system, for instance. In this case the advantage results that the filter means may be very small since the ripple of the direct voltage to be smoothed is of very high frequency due to the basic alternating current being in its turn of high frequency type. With a television device comprising such a tube the most appropriate impulse frequency available in this regard is the line impulse frequency. Preferably this frequency is conveyed to the grid of a controllable commutating electron tube which has a self-inductance or choke coil included in its anode circuit. At the end of each impulse the current in this coil suddenly fades. This rapid current variation causes a high potential peak to arise at the anode of the commutating tube. An arrangement of this kind, however, as compared with high tension systems fed directly from a mains supply, has the drawback that on taking current from it the direct voltage considerably varies in dependence on the respective load.

According to the present invention, in order to obviate this disadvantage the direct or unidirectional current taken from the high voltage source is used for regulating the voltage impulses that serve to charge the customary condenser.

The drawing shows a circuit diagram of one embodiment of the invention. Only those parts are represented which are necessary for understanding the invention.

The said controllable commutating electron tube is designated R. To the grid G of this tube the line impulses for a cathode ray tube, not shown, are conveyed. In the anode circuit of the tube R a choke coil or self-inductance L is included. Joined to the anode A are a rectifier B and a condenser C, designated as smoothing condenser. At point *a* the high tension for the cathode ray tube is derived. The negative lead to the cathode ray tube contains a resistance R_a from which a voltage is taken that depends on the current derived from the high tension circuit, the drop of potential across R_a depending on this current. Resistance R_a and a resistance R_x are connected in series with respect to the biasing grid voltage connected over a resistance R_g to point *g*. The drops of potential

across the resistances R_a , R_x are subtracted one from the other. The drop of potential across R_x is so calculated that the tube R is usually blocked. Tube R is opened by impulses impinging upon the grid thereof. Consequently, a current arises in the coil L. As soon as the impulse disappears and thereby causes the tube to be again blocked the current in L fades, whereby a potential peak is caused to arise at the anode A. The magnitude of this potential peak depends upon the maximum intensity of the current which during the impulse action flows through L. If now the high tension side is loaded, that is, if the current is flowing in the anode circuit of the cathode ray tube containing resistance R_a , the drop of potential across R_a acts in opposition to the invariable grid bias of the tube R, that is, the bias produced by R_x . As a result the tube R is still farther opened by the impulse striking its grid G. The current flowing through L is thus intensified. The current so amplified acts still to increase the potential peak at the moment the coil L becomes deenergized. By calculating resistance R_a suitably it is possible perfectly to compensate the decrease of the voltage at C caused by current in the load circuit and thereby to insure that a completely horizontal current voltage characteristic shall be peculiar to the entire rectifier system. Also an over-compensation may of course be provided in a manner to insure that the voltage rises whenever the load increases.

What is claimed is:

1. In combination, a source of direct current, a converter circuit connected to said source including a controllable electron valve connected in series with an inductance element said electron valve having a control circuit, a source of periodic current for energizing the control circuit of said valve to produce periodic voltage pulses across said inductance element, a work circuit connected to said converter circuit and including a condenser for integrating the current pulses produced by said inductance, and means providing a coupling between said work circuit and said control circuit for increasing the amplitude of said pulses in accordance with increase in amplitude of the current flowing in said work circuit.

2. In combination, a source of direct current, a converter circuit connected to said source including a controllable electron valve connected in series with an inductance coil, said electron valve having a cathode, a grid and an anode, a source of periodic current for energizing the grid

of said controllable valve to produce periodic voltage pulses across said inductance coil and at the anode of said valve, a biasing resistance connected in the anode circuit of said valve adjacent said cathode, a connection from said biasing resistance to the grid to normally block said valve, a load circuit connected between said anode and the outer end of said biasing resistance, a smoothing condenser connected from the anode side of said load circuit to the cathode side of said biasing resistance, a second biasing resistance included in series with one line of said load circuit

5 adjacent said biasing resistor and being included in said biasing connection to said grid, whereby said second biasing resistance produces a biasing voltage variable in accordance with variations in the current flowing in said load circuit and in opposition to the biasing voltage produced by said first biasing resistance, and a rectifier included in the load circuit connection between said anode and said condenser for preventing discharge of said condenser through said valve and said source of current.

JOHANNES PRAST.