O. C. ROOS.

RADIOTELEGRAPH TRANSMITTING SYSTEM.

APPLICATION FILED JULY 14, 1917.

1,278,507. Patented Sept. 10, 1918.

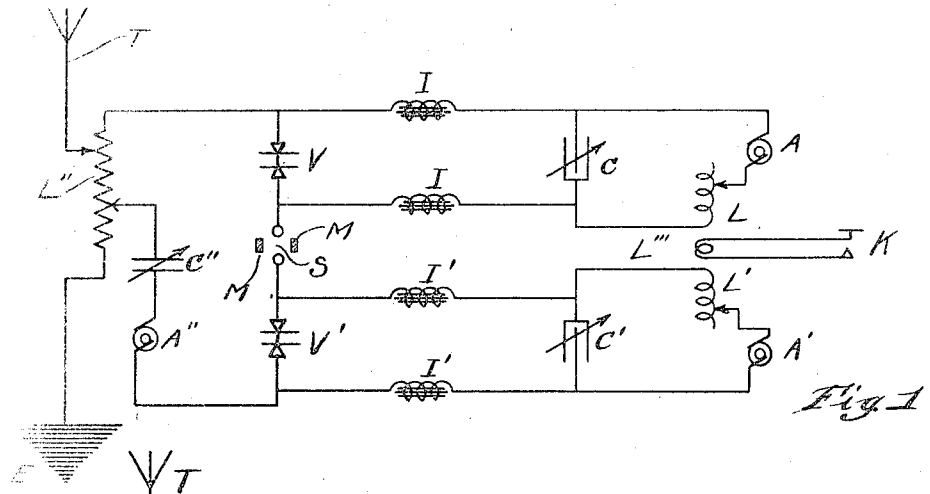


Fig. 1

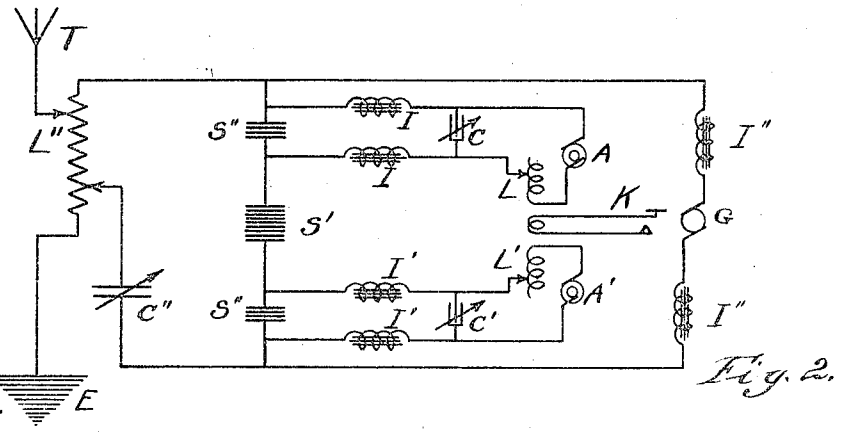


Fig. 2.

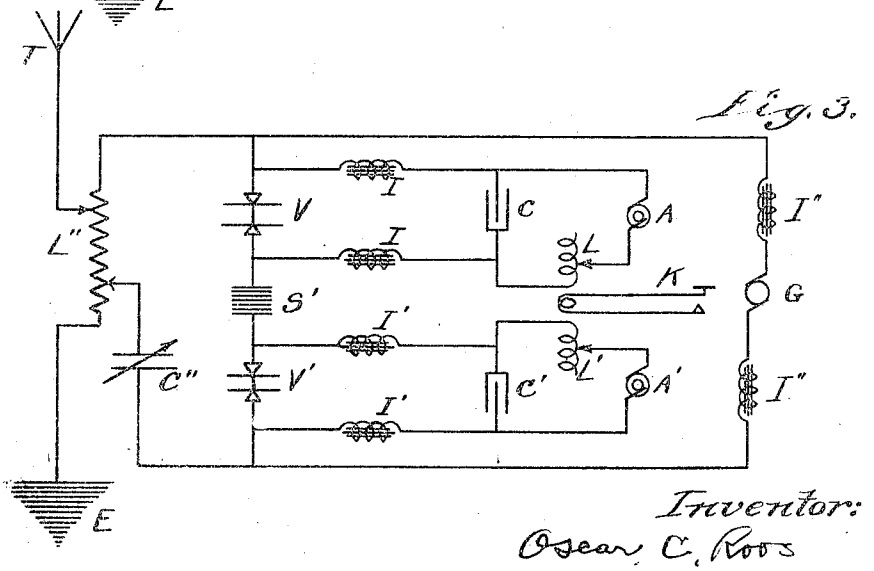


Fig. 3.

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RADIOTELEGRAPH TRANSMITTING SYSTEM.

1,278,507. Specification of Letters Patent. Patented Sept. 10, 1918.

Application filed July 14, 1917. Serial No. 180,528.

To all whom it may concern:

Be it known that I, OSCAR C. ROOS, a citizen of the United States, and a resident of Allston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Radiotelegraph Transmitting Systems, of which the following is a specification.

My invention relates to radio-telegraph transmitting systems, and its objects are to provide a system in which the discharge of the oscillating circuit condenser may be readily controlled over a wide tone-range and otherwise to improve such systems and increase the efficiency thereof.

Three illustrative embodiments of my invention are shown conventionally in the accompanying drawings; but it will be understood that various modifications may be made both in the apparatus and the system of circuits without departing from the principle of my invention.

In the drawings—

Figure 1 is a diagram of a radio-telegraph transmitting system involving my invention; and Figs. 2 and 3 are diagrams of modifications.

A transmitting antenna T is associated in any suitable way with an oscillation-producing circuit and is grounded at E.

In Fig. 1 a condenser C″ is connected in series with an inductance L″ a radio-frequency generator A″, which may be either a high-frequency alternator or an arc, a spark gap S, which as shown may be placed in the field of the magnet M or else in a vessel containing a compressed gas, and two trigger valves or arresters V, V′, one on either side of said spark gap.

I may employ as an arrester a spark gap or a quenched spark gap, or two oppositely arranged rectifiers such as a point and plate rectifier, a hot and cold electrode rectifier, a mercury vapor rectifier, or an aluminum or other film arrester, etc. For illustrative purposes only I have shown in Figs. 1 and 3 two opposed point and plate rectifiers V, V′ and in Fig. 2 two quenched spark gaps S″, S″. I do not limit myself as to the kind, number or arrangement of the arresters employed, for my object may be accomplished by a variety of devices which will serve normally to prevent the condenser from discharging across the spark gap, which are capable of being rendered ineffective by being broken down by a momentary impulse from an auxiliary source, and which regain their effectiveness immediately upon the cessation of such impulse.

The auxiliary source which I prefer consists as shown of two low-voltage alternating-current generators A, A′, of different frequencies connected, respectively, in series with the adjustable condenser C and adjustable coil L, and the adjustable condenser C′ and the adjustable coil L′, the circuit of each generator being attuned approximately to the frequency of current developed therein. By means of the coil L‴ in inductive relation to the coils L, L′, the latter not being in inductive relation with each other, said circuits may be thrown into resonance with the currents developed by their respective generators when the key K is closed.

The circuits of the generators are connected with the arresters, respectively, so that the potential resulting from resonance will act upon them or break them down, and thereby render them ineffective. In the present instance the condensers C, C′ are connected, respectively, with the arresters V, V′, or S′, S″, by leads which include the choke coils I, I, or I′, I′, respectively.

In Figs. 2 and 3 the condenser is charged by a direct current generator G, which is protected by the choke coils I″, I″, and is connected in series with the quenched spark gap S′.

The operation is as follows: Neither the high-frequency generator A″ nor the dynamo G can break down a larger gap than S or S′ and the arresters, therefore, prevent the discharge of the condenser C″ across the gap unless they are simultaneously broken down. They will be simultaneously broken down 2 $(n—m)$ times a second where n and m represent the frequencies of the generators A, A′ respectively, so that the tone produced in the receiving system will be the "beat frequency" of said generators, and this tone, as will be obvious, may be widely varied by slightly altering the speed of one or both generators. My invention will thus be seen to afford a very simple and flexible electrical substitute for various mechanical devices such as the transmitting "tone wheel," the rotating spark gap, etc., for securing different tone effects.

In the case of the embodiments of my invention shown in Figs. 2, and 3 it is generally desirable to use a generator G which has a falling voltage characteristic in order

to avoid the possibility of arcing in the gap S'.

Having described illustrative embodiments of my invention without however limiting the same thereto, what I claim and desire to secure by Letters Patent is:

1. A radio-telegraph transmitting system, comprising in combination a circuit provided with a condenser and a spark gap, a source of electrical energy arranged to charge said condenser, two arresters in said circuit, one on either side of said spark gap, for preventing the discharge of said condenser across said gap, a transmitting key, and means controlled by said key for simultaneously breaking down both arresters.

2. A radio-telegraph transmitting system, comprising in combination a circuit provided with a condenser and a spark gap, a source of electrical energy arranged to charge said condenser, two electric valves in said circuit, one on either side of said spark gap, for preventing the discharge of said condenser across said gap, a transmitting key, and means controlled by said key for simultaneously breaking down both of said valves.

3. A radio-telegraph transmitting system, comprising in combination a circuit provided with a condenser and a spark gap, a source of electrical energy arranged to charge said condenser, two arresters in said circuit, one on either side of said spark gap, for preventing the discharge of said condenser across said gap, alternating current generators of different frequencies associated respectively with said arresters, and a key for controlling said generators.

4. A radio-telegraph transmitting system, comprising in combination a circuit provided with a condenser and a spark gap, a source of electrical energy arranged to charge said condenser, two arresters in said circuit, one on either side of said spark gap, for preventing the discharge of said condenser across said gap, alternating current generators of different frequencies, circuits attuned approximately to the frequencies of said generators, respectively, connections from said circuits to said arresters, respectively, and key controlled means for throwing the last named circuits into resonance with the currents developed by their respective generators.

In testimony whereof I have hereunto subscribed my name this 2nd day of July, 1917.

OSCAR C. ROOS.