

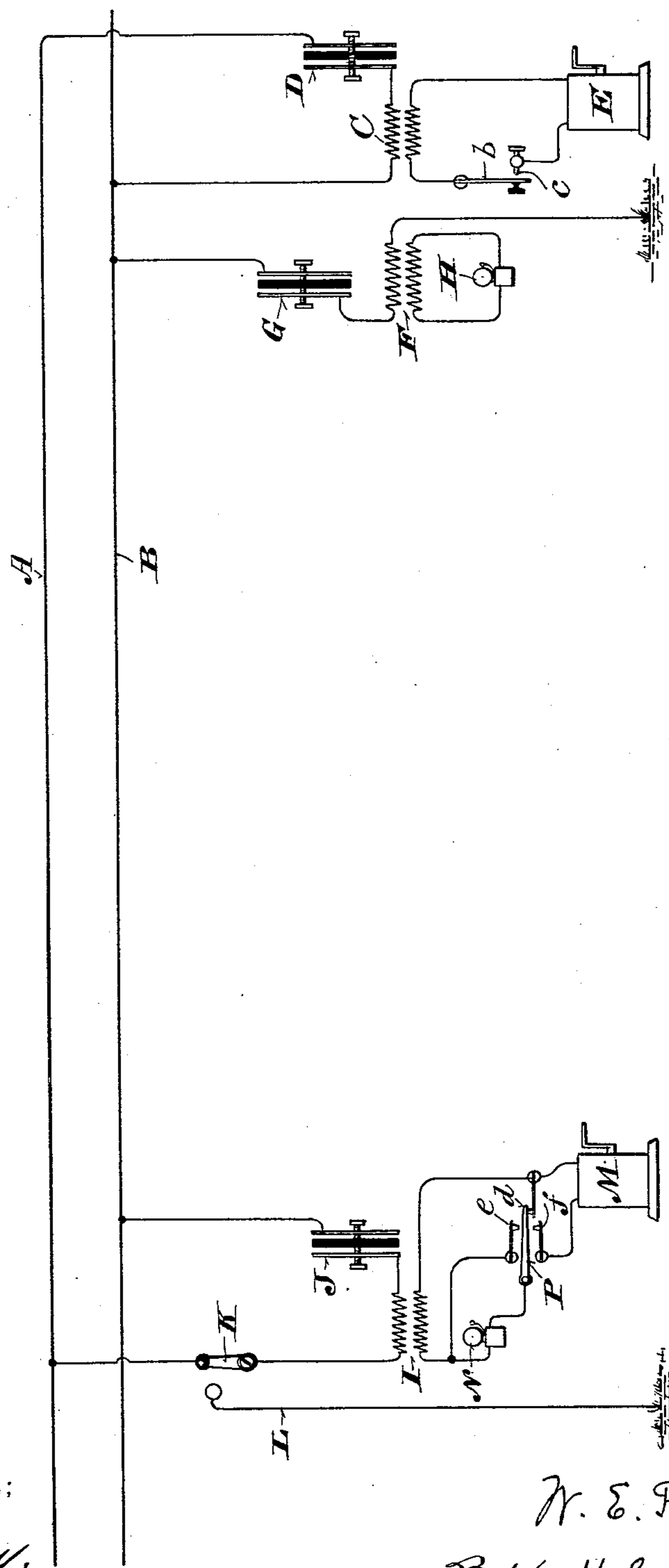
No. 684,303.

Patented Oct. 8, 1901.

W. E. PEMBLETON.
ELECTRIC TELEPHONE SYSTEM.

(Application filed Jan. 18, 1901.)

(No Model.)



Witnesses:
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UNITED STATES PATENT OFFICE.

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ELECTRIC-TELEPHONE SYSTEM.

SPECIFICATION forming part of Letters Patent No. 684,303, dated October 8, 1901.

Application filed January 18, 1901. Serial No. 43,714. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. PEMBLETON, a citizen of the United States, and a resident of Wittenberg, in the county of Shawano and State of Wisconsin, have invented certain new and useful Improvements in Electric-Telephone Systems; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has for its object to eliminate resistance of the coils of call-signal magnetos from talking-circuits of electric-telephone systems; and it consists in what is hereinafter particularly set forth with reference to the accompanying drawing and subsequently claimed.

The drawing is a diagram illustrating an application of my invention.

Referring by letter to the drawing, A B indicate a pair of parallel conductors constituting the line of an electric-telephone system to which my invention is applicable. Between the conductors all the telephones on the line are bridged in the usual manner, normally in open circuit. At a central station on the line the secondary of an induction-coil C is bridged between the conductors aforesaid by an electric resonator D, and in normally open circuit with the primary of said coil are a magneto E, a spring contact-plate *b*, and an adjustable contact-point *c*, these contacts serving as means for making and breaking the circuit. The resonator is shown as comprising a pair of conductor-plates, an intermediate insulating-plate, and opposing conductor-screws, these screws being adjustable in all the plates to vary the spark-gap, this gap being shown in the sectional illustration of resonator D constituting part of central-station equipment. At the aforesaid station the secondary of another induction-coil F connects conductor B and ground through an electric resonator G, that is preferably similar in detail to the one above specified, an electric call-bell or other electric signaling device being electrically connected to both terminals of the primary of said coil.

At each of the substations on the line is an induction-coil I, having the secondary thereof in circuit with an electric resonator J and conductors A B, this resonator being preferably similar in detail to those set forth in the foregoing. A switch K is employed to at

times cut out conductor A and put a terminal wire L, connected to ground, in closed circuit with the secondary of coil I, the resonator J, and conductor B. The primary of induction-coil I is in circuit with a magneto M and an electric call-bell N or other electric signaling device, this circuit being normally closed by a switch-blade P in touch with a contact-point *d*, as herein shown. Spring-contacts *e f* are shown arranged in opposite directions from switch-blade P, normally out of touch with same and electrically connected to be in a circuit with magneto M and primary of induction-coil I.

To signal from central station to a substation, contact of plate *b* is had with point *c* and magneto E operated to generate current of sufficient strength in the then closed circuit that includes induction-coil C, resonator D, conductor A, induction-coil I, resonator J, and conductor B, whereby the signal N is energized, it being understood that switch K is then in normal position to complete metallic circuit. To signal central station from a substation, switch K is swung to touch on the adjacent terminal of ground-wire L, and contact *f* is moved against switch P to force the latter out of touch with contact *d* and into touch with contact *e*, after which the magneto M is operated to generate a current of sufficient strength through induction-coil I, resonator J, conductor B, resonator G, and induction-coil F, whereby the electric signal H is energized.

By employment of an electric resonator to obtain a spark-gap or air-space in circuit with an induction-coil, as herein shown and described, it is evident, as an electrical law, that current of low potential, regardless of amperage, will not pass a spark-gap between one conductor and another; but if the current be of sufficiently high potential, no matter how low the amperage, it will readily cross said gap, and thereafter the resistance of same is not materially appreciable. Hence it will be understood that the ordinary low-potential voice-current used in telephony will not cross the spark-gap of a resonator such as is herein shown and described. Consequently the resonator is effective as a barrier for voice-currents without materially increasing the resistance of the signal-circuit

in which it is placed, the induction-coil in this same circuit being utilized to transform the current of an ordinary magneto-electric generator into a current of high potential, but of corresponding low amperage.

From the foregoing it will be readily understood that the ordinary low-voltage currents for talking-circuits on the line will follow the conductors A B and that currents of higher voltage are requisite for energizing the signal devices, the latter currents passing from one to the other of said conductors across the spark-gaps of the electric resonators arranged as herein set forth.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An electric-telephone system having the call-signal devices thereof in circuit with induction-coils, electric resonators and talking-circuit conductors, together with means for generating current sufficient to cross the spark-gaps of resonators in a closed calling-circuit.

2. An electric-telephone system having the call-signal devices thereof in circuit with induction-coils, electric resonators, talking-circuit conductors and sources of current, together with means for closing calling-circuits, the current from any of the sources aforesaid being sufficient to cross the resonators in the calling-circuit therewith.

3. An electric-telephone system having central station thereof provided with a source of current in normally open circuit with an induction-coil, an electric resonator and talking-circuit conductors, an electric signal device at said station in circuit with an induction-coil, an electric resonator, one of said conductors and ground, a magneto at each substation in normally open circuit with an induction-coil, electric resonator and aforesaid conductors, an electric signal device at each substation in normally closed metallic circuit with the induction-coil and resonator thereat, as well as with said conductors, means for switching current from metallic circuit to ground, and other means for putting the magneto in the grounded circuit.

4. An electric-telephone system having call-signal devices thereof in circuit with induction-coils, voice-current resistances and talking-circuit conductors, together with means for generating current sufficient to overcome said resistance in a closed calling-circuit.

In testimony that I claim the foregoing I have hereunto set my hand, at Wittenberg, in the county of Shawano and State of Wisconsin, in the presence of two witnesses.

WILLIAM E. PEMBLETON.

Witnesses:

WM. G. HEINS,
OLIVE ANDERSEN.