D. H. WILSON.

TELEPHONE APPARATUS.

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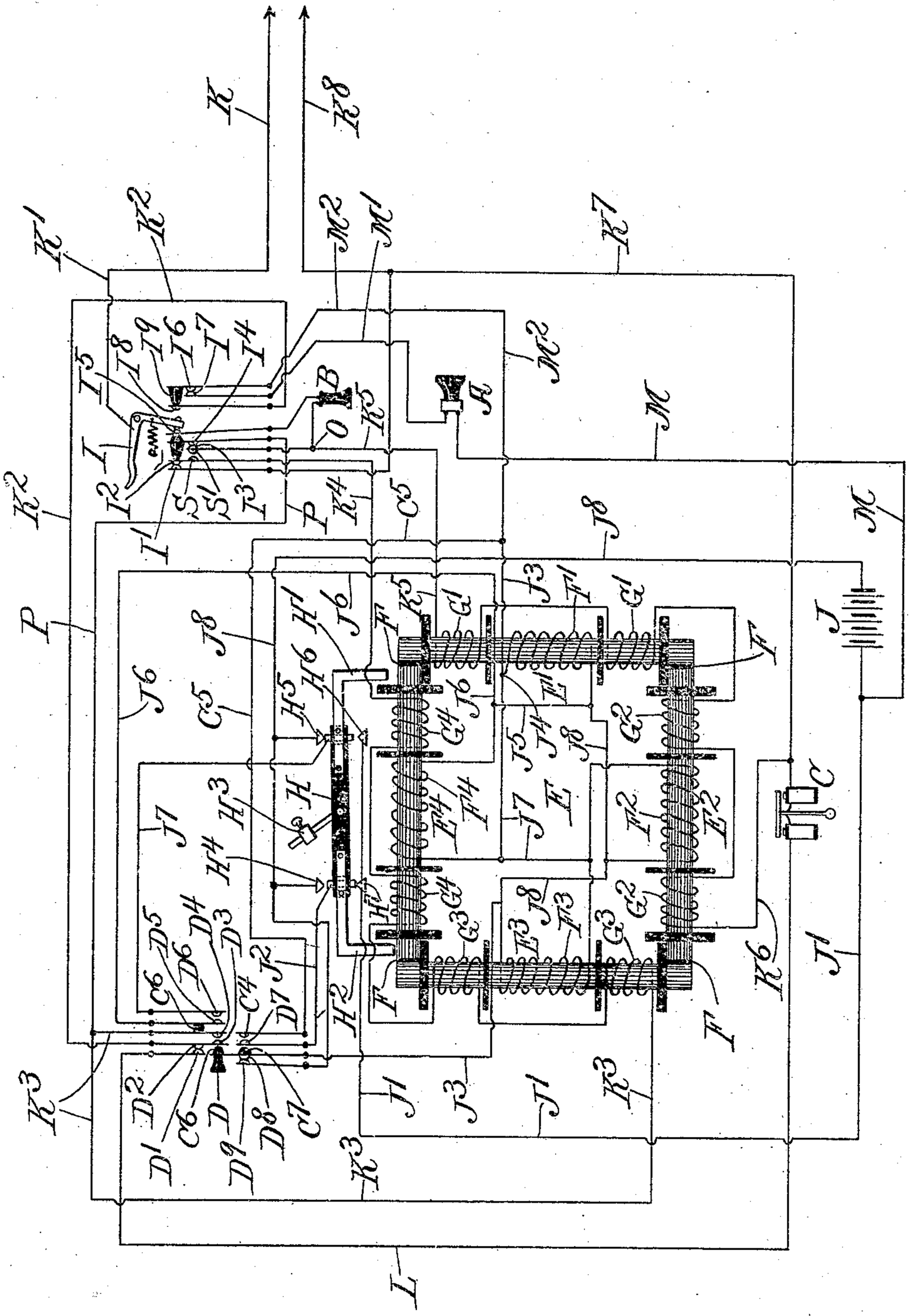
956,251. **Patented Apr. 26, 1910.**



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TELEPHONE APPARATUS.

956,251. Specification of Letters Patent. **Patented Apr. 26, 1910.**

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To all whom it may concern:

Be it known that I, DAVID H. WILSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Telephone Apparatus, of which the following is a specification.

My invention relates to telephone apparatus, and has for its object to provide a new and improved apparatus of this description.

My invention is illustrated in the accompanying drawings, wherein the figure is a diagrammatic view showing the apparatus at one station.

Like letters refer to like parts throughout the figure.

Each set of instruments is provided with a transmitter A, a receiver B, an alarm device C, a ringing switch D, and a transformer or induction coil E. The induction coil is provided with a core divided up into four sections E^1, E^2, E^3 and E^4. Two of these sections are interposed between the poles of the adjacent sections. The poles of the several sections are magnetically insulated from each other in any suitable way, as, for example, by the pieces of magnetic insulation F. Each of the sections of the core of the induction coil has a coil of wire upon it. As herein illustrated, the sections are provided with the primary coils F^1, F^2, F^3 and F^4, and secondary coils G^1, G^2, G^3 and G^4. The secondary coils are preferably divided up into sections, one section being placed on each side of the primary coil. The secondary coils are arranged in sets, and the circuits are such that the secondary coils are all in series when signaling, and the sets are in multiple when talking. The windings of the coils are such that the adjacent poles of any two sections of the core are of opposed polarity. Associated with the induction coil is a circuit varying device comprising a pivoted part H having attached thereto the two magnets H^1 and H^2, arranged to be brought into proximity to the poles of one of the sections of the core of the induction coil. These magnets are arranged so that the poles at the end are similar.

I prefer to provide the device with an adjustable weight, H^3, at one side of the center, adapted to bring one pole of the circuit varying device into proximity to a pole of the induction coil core. The speed of the circuit varying device may be controlled by moving the adjustable weight. Associated with this device are the contacts H^4, H^5, H^6, and H^7. Associated with the signaling switch are a series of contacts D^1, D^2, D^3, etc., which are changed in relative position so as to vary the circuits, and the insulating pieces C^6 and C^7. Associated with the receiver hook I are a series of contacts I^1, I^2, I^3, etc., which are varied in position by taking the receiver from the hook. There is also provided an insulating piece I^9.

When it is desired to signal, the signaling switch D is moved. This closes the circuit through the primary coils of the induction coil, which may be traced as follows: from the source of electric supply J, by conductor J^1, to contact H^7, thence by conductor J^2, to contacts D^7 and C^4, thence by conductor C^5 to conductor J^3, to the point J^4, and thence through the various primary coils in multiple; the current passes from J^4 through coil F^1 and then to conductor J^5, to conductor J^6, also from the point J^4, by conductor J^7, through coil F^4 to conductor J^6, also from conductor J^7 through coil F^2 and conductors J^8 and J^5 to conductor J^6, also from conductor J^7 through coil F^3 and conductors J^8 and J^5 to conductor J^6, thence through conductor J^6 to contacts D^5 and D^6 thence through conductor J^7 to contact H^5, from contact H^5 through conductor J^8, back to the battery. When the current passes through the primary coils the several cores are energized, and the section E^4 of the core acts upon the circuit varying device. Since this circuit varying device has like poles, one of the poles will be repelled and the other attracted, and the device moved so as to disconnect contacts H^5 and H^7 from the circuit, and to connect contacts H^4 and H^6 in the circuit. The circuit through the primary coils is then reversed, and traced as follows: from battery J through conductor J^1, contact H^6, conductor J^7, contacts D^6 and D^5, conductor J^6, thence through the coils in multiple, thence through conductor J^3, conductor C^5, contacts C^4 and D^7, conductors J^2 and J^8, back to the battery. The circuit being thus reversed changes the polarity of the section E^4 of the core of the

induction coil, which causes the circuit varying device to move to the position shown in full lines. This operation is repeated, and the make and break of the current induces a current in the secondary coils which current is sent out upon the line. The secondary coils are divided into sets of two, connected in series, during this operation. Beginning from line wire K the secondary circuit is traced as follows: from line K through conductor K^1 to receiver hook I, thence through contact I^8, conductor K^2, contacts D^3 and D^4, conductor K^3, through secondary coils G^3 and G^4, conductor K^4, contacts S, S^1, conductor K^5, secondary coils G^1 and G^2, conductor K^6, conductor K^7, to line K^8. This current actuates the signaling device located at the station called. When the call comes from a distant station the ringing switch is in the position shown in full lines. The signaling current then passes from line K to receiver hook I, thence through conductor K^2, contacts D^2, D^1, conductor L, signaling device C, and conductor K^7 to line K^8, the secondary coils being cut out of circuit. When talking the ringing switch being in the position shown in full lines, the primary circuit is as follows: from the source of electric supply J through conductor M to transmitter A, thence through conductor M^1, contacts I^7, I^6, conductor M^2, conductor J^3 to point J^4, the current then divides passing through each of the primary coils in multiple, as heretofore traced, and thence through conductor J^6, contacts D^5, D^6, conductor J^7, contact H^5 and conductor J^8, back to the source of electric supply. The variations of the circuit due to the movement of the diaphragm of the transmitter induce a talking current in the secondary coils which is traced as follows, the receiver at this time being removed from the hook, the lower part of such hook being moved to the left to control the contacts on the left thereof, as shown in full lines: from line K to receiver hook, thence through contact I^5 to receiver B, thence to point O where the current divides, a part of it passing through conductor K^5 and secondary coils G^1 and G^2, thence by conductors K^6 and K^7 to line K^8; the other part passes from the point O to contact I^3, to contact I^4, thence by conductor P and conductor K^3 through secondary coils G^3 and G^4, thence through conductor K^4 to contact I^2, thence to contact I^1, and thence to line K^8.

It will be noted that during the use of the apparatus the secondary coils are connected in sets of two in series, the sets being connected in multiple.

I have described in detail a particular construction embodying my invention, but it is of course evident that the parts may be varied in form, construction and arrangement, and I, therefore, do not limit myself to the particular construction shown.

By means of the construction herein shown I am enabled to talk through lines which because of induction and other adverse conditions have heretofore been considered impractical as telephone lines.

I claim:

1. A telephone system comprising a transmitter, a receiver, an induction coil having a plurality of secondary coils, circuit-varying devices for connecting said coils in series when signaling and in multiple when talking, substantially as described.

2. A telephone system comprising a transmitter, a receiver, and an induction coil, said induction coil provided with a core divided up into a series of sections magnetically insulated from each other, each section provided with a primary and secondary winding, and a circuit varying device connected with the primary windings and having pole pieces of like polarity opposed to the poles of one of the sections of said core, and means for connecting said circuit varying device in circuit when signaling.

3. A telephone system comprising a transmitter, a receiver, and an induction coil, said induction coil provided with a core divided up into a series of sections magnetically insulated from each other, each section provided with a primary and secondary winding, and a circuit varying device connected with the primary windings and having pole pieces of like polarity opposed to the poles of one of the sections of said core, an adjustable weight attached to said circuit varying device for varying the speed of movement thereof, and means for connecting said circuit varying device in circuit when signaling.

4. A telephone system comprising a transmitter, a receiver, an induction coil having a plurality of secondary coils, means for connecting said coils in series when signaling, and a circuit-making and breaking device associated with the core of the induction coil so as to be actuated thereby during the process of signaling.

5. A telephone system comprising an induction coil, a transmitter, a receiver, with circuit connections between them, said induction coil comprising a core divided up into a series of sections magnetically insulated from each other, each section provided with a primary and secondary winding, there being provided means for connecting the primary windings of all the sections in multiple and the secondary windings in series multiple.

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