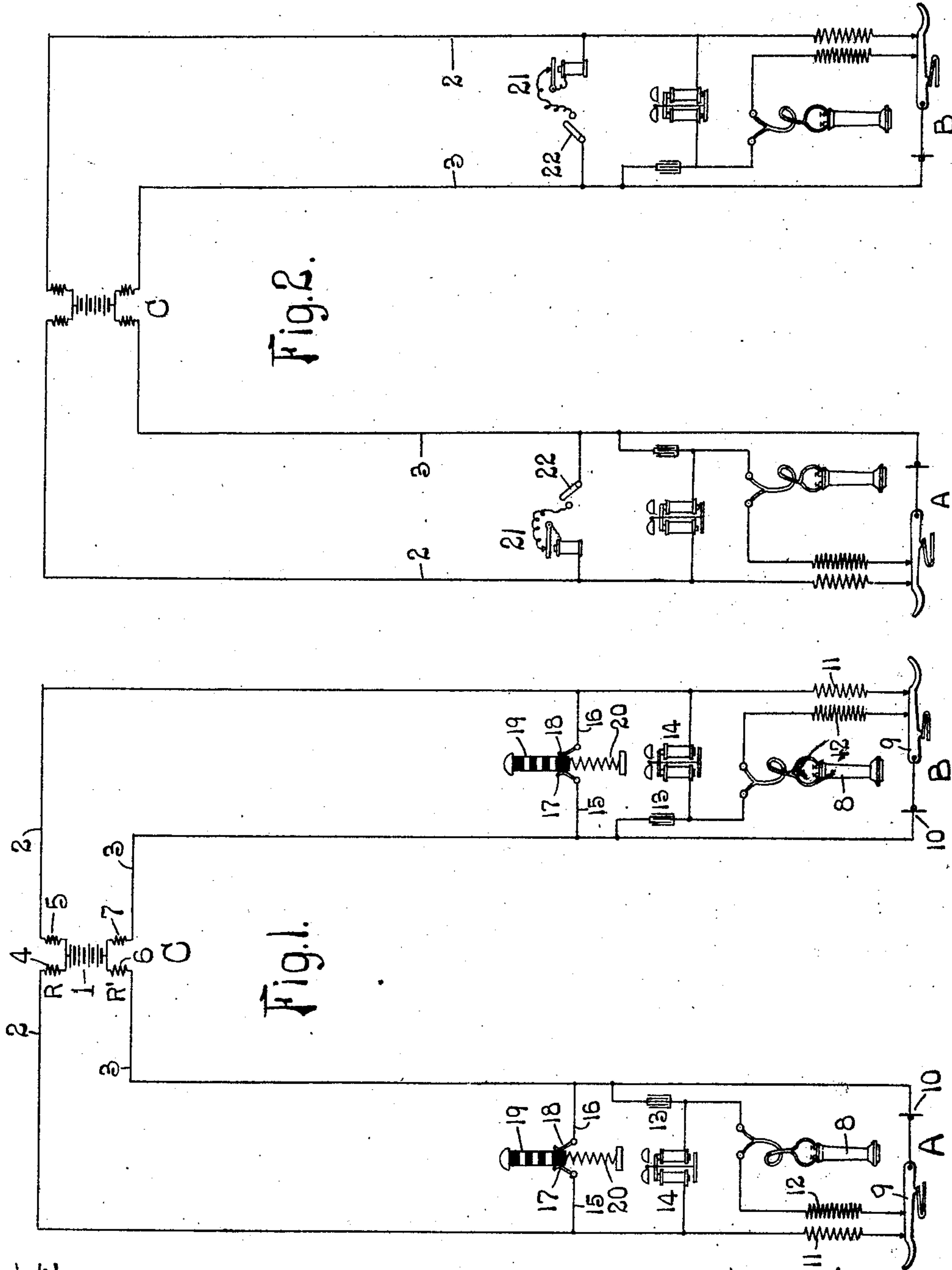


No. 896,836.

PATENTED AUG. 25, 1908.

J. J. KELLY.
TELEPHONE SYSTEM.

APPLICATION FILED APR. 25, 1907.



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN J. KELLY, OF ST. LOUIS, MISSOURI.

TELEPHONE SYSTEM.

No. 896,836.

Specification of Letters Patent.

Patented Aug. 25, 1908.

Application filed April 25, 1907. Serial No. 370,289.

To all whom it may concern:

Be it known that I, JOHN J. KELLY, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Telephone Systems, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a diagrammatical view illustrating a telephone system embodying the features of my invention; and Fig. 2 is a modified form of the system shown in Fig. 1.

This invention relates to telephone systems.

In telephone systems used at present when two subscribers' lines are connected together and conversation is being carried on over these lines, if it becomes necessary for one of the subscribers to leave the telephone temporarily the other subscriber must retain the receiver at his ear and wait until the absent subscriber is ready to continue the conversation. When the absent subscriber returns to the telephone he notifies the waiting subscriber by starting the conversation. A great waste of time is often caused by these present systems because the waiting subscriber must retain the receiver at his ear while the person at the connected station is absent from the telephone.

The object of my invention is to provide a telephone system in which telephone stations are provided with a signal and means for operating a similar signal at a distant station, this signal being preferably in the form of a bell, lamp or other device that will be effective when the signaled person is absent from the telephone.

It is a further object of my invention to provide this signal at a very low cost.

Referring to Fig. 1 of the drawings, two subscribers' stations A and B are shown connected together through a central exchange C, where a battery 1 is located.

2 and 3 indicate line wires leading from the subscribers' stations to the central exchange.

The current from the positive pole of battery 1 divides and passes through the separate windings 4 and 5 of a repeating coil R to the line wires 2. The two portions of the

current then pass through the apparatus at the two subscribers' stations, and return to the central exchange through the windings 6 and 7 of a repeating coil R' at the negative pole of battery 1.

When the receiver 8 is removed from the hook switch 9, the latter closes a circuit containing the transmitter 10 and the primary coil 11 of an induction coil. The hook switch connects the primary 11 with the secondary 12, and closes another circuit containing the secondary 12, the receiver 8 and a condenser 13. When the receiver is on the hook the circuits just described are open and the only path for a current from battery 1 is through line 2, condenser 13, magneto bell 14 and back through line 3 to the battery. Current from battery 1, which is constantly connected to lines 2 and 3, cannot, therefore, on account of this condenser, flow through this circuit just traced.

When the operator at the central exchange desires to call a subscriber, a ringing key (not shown) is depressed. This ringing key disconnects the line wires 2 and 3 from battery 1 and cuts in an alternating current from a suitable generator; hence, when the ringing key is depressed an alternating current will pass over line 2, through bell 14 and condenser 13, back through line 3 to the generator, and thus ring bell 14.

When the subscribers' stations A and B are connected at the central exchange, as herein shown, and the resistance of the transmitter at station A is varied, the current flowing from battery 1 will be correspondingly varied. These variations passing through the windings 4 and 6 of the repeating coils will act inductively on the windings 5 and 7 which are in circuit with station B. As the resistance of the transmitter at station A is varied, the steady current of the battery is changed into a fluctuating current. This fluctuating current passes through the repeating coils at the central exchange and thereby produces an alternating (or fluctuating) current in the lines 2 and 3 of station B. The bells 14 offer such a high resistance, or impedance, to the feeble and very rapidly fluctuating voice current that it cannot pass through them.

15 and 16 indicate wires which lead from line wires 2 and 3 to springs 17 and 18. The springs 17 and 18 press against a member

19, the latter being composed of layers of conductors which are insulated from each other. The member 19 is normally held in the position shown in the drawing by means of a spring 20.

We will now suppose that conversation is being carried on over the subscribers' lines 2 and 3, and it becomes necessary for subscriber A to leave the telephone temporarily. At this time subscriber B may also leave his telephone. It will, of course, be understood that neither subscriber replaces the receiver on the hook during his temporary absence. When subscriber A is ready to resume the conversation he depresses the member 19 at his station, and thereby alternately opens and closes a circuit containing the repeating coils 4 and 6 and battery 1. This causes a pulsating current to pass through the lines of station B. The current passing through the condenser and bell at station B operates said bell (or lamp, if an incandescent lamp be substituted for the bell), and thereby calls subscriber B to the telephone. If the member 19 at station B is depressed the action will be similar to that just described, that is to say, the bell (or lamp) at station A will be operated.

This signaling device would be useful in many other ways; for example, when the person called for could not answer immediately the calling subscriber could leave the telephone until he is signaled from the station called for.

Fig. 2 is a modified form of the means for signaling a subscriber from a distant station, said means being applied to a telephone system comprising the same parts as the telephone system shown in Fig. 1. In this form a buzzer 21 and a switch 22 are connected across the lines 2 and 3 at the telephone stations. When switch 22 is closed the buzzer 21 will alternately open and close the circuit comprising the battery and repeating coils at the central exchange, and thus ring the distant subscriber's bell.

While I have herein shown my improved signal as comprising a bell and a device for intermittently opening and closing a telephone circuit, my invention is not limited to this construction as many modifications of the device herein shown will suggest themselves to those skilled in the art. This would be especially true when my improved signal is applied to a telephone system having its parts arranged differently from those herein shown.

If desired, the signal bell may be provided with a spring to pull the bell hammer in one direction. The signal could then be operated by a pulsating direct current, and the pulsations in the current may be produced by a device at the calling station, or the bell

could be provided with an ordinary intermittent circuit-breaker.

It is obvious that instead of a bell, an incandescent electric lamp could be employed as a signaling device, the completion of the circuit through the lamp causing the lamp to glow. If the circuit was made and broken the lamp would be flashed.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A telephone system comprising a central exchange, subscribers' stations connected to the central exchange, said stations having a call bell operable from the central exchange, and means for operating said call bell from a distant subscriber's station for the purpose described without affecting the signal devices at the central exchange; substantially as described.

2. A telephone system comprising a central exchange, subscribers' stations connected to the central exchange, said stations having a call bell operable from the central exchange, and means for operating said call bell from a distant subscriber's station for the purpose described, said means including a source of energy at the central exchange; substantially as described.

3. A telephone system comprising a central exchange, subscribers' stations connected to the central exchange, a signal at a subscriber's station, said signal being operable from the central exchange, and means for operating said signal from a distant subscriber's station when the circuit which connects said subscribers' stations together is closed for conversation; substantially as described.

4. A telephone system comprising a central exchange, telephones connected to the central exchange, a bell at a telephone station, said bell being operative when the telephone circuit is closed, and means for operating said bell from a distant telephone station said means including a source of energy at the central exchange; substantially as described.

5. A telephone system comprising a central exchange, telephones connected to the central exchange, a bell at a telephone station, said bell being operable from the central exchange, and means for operating the bell from a distant telephone station, said operating means including a source of energy at the central exchange and being effective when the telephone circuits at both of said stations are closed; substantially as described.

In testimony whereof I hereto affix my signature in the presence of two witnesses, this twenty third day of April 1907.

JOHN J. KELLY.

Witnesses:

LENORE WILSON,
GEORGE BAKEWELL.