

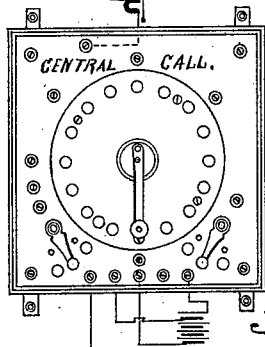
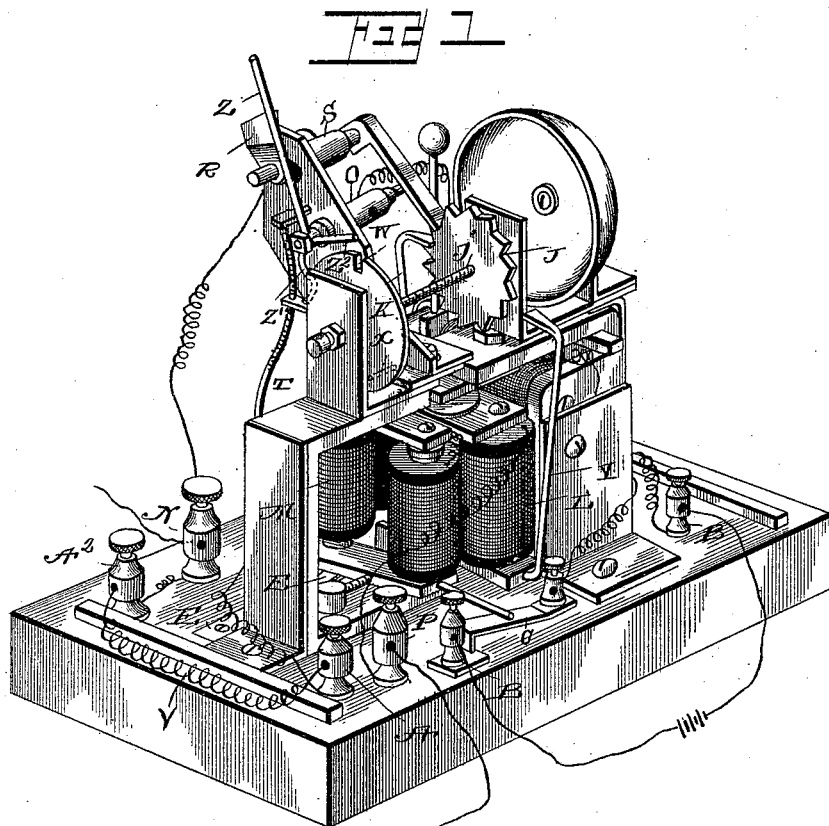
(No Model.)

3 Sheets—Sheet 1.

J. H. KINSMAN.
TELEPHONE CALL.

No. 491,893.

Patented Feb. 14, 1893.



Witnesses

John Donnie
Franklin Moore

Inventor

John H. Kinsman

By his Attorney

A. Deane

(No Model.)

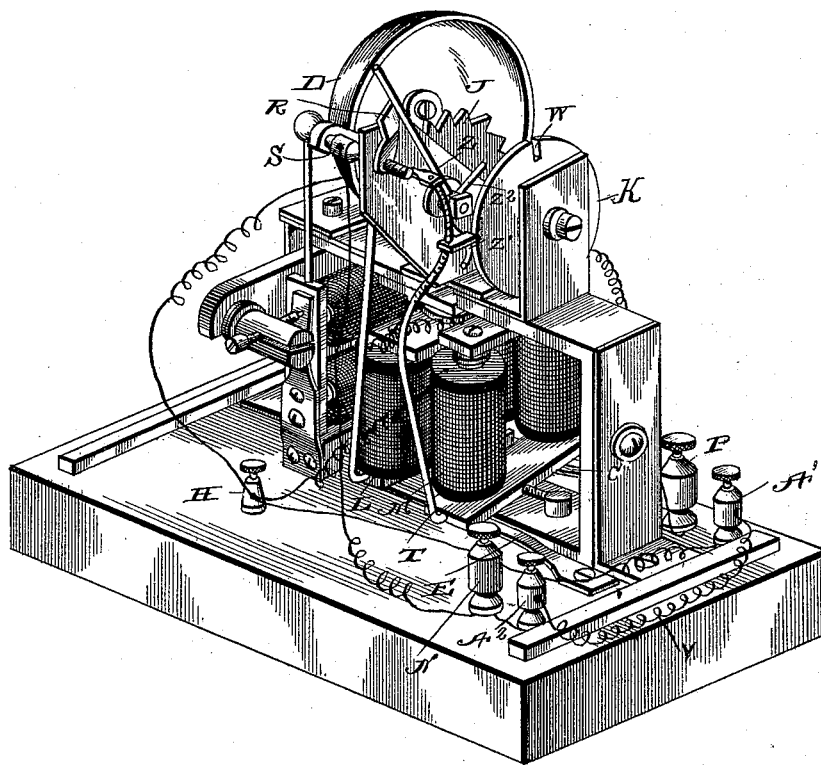
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FIG 2



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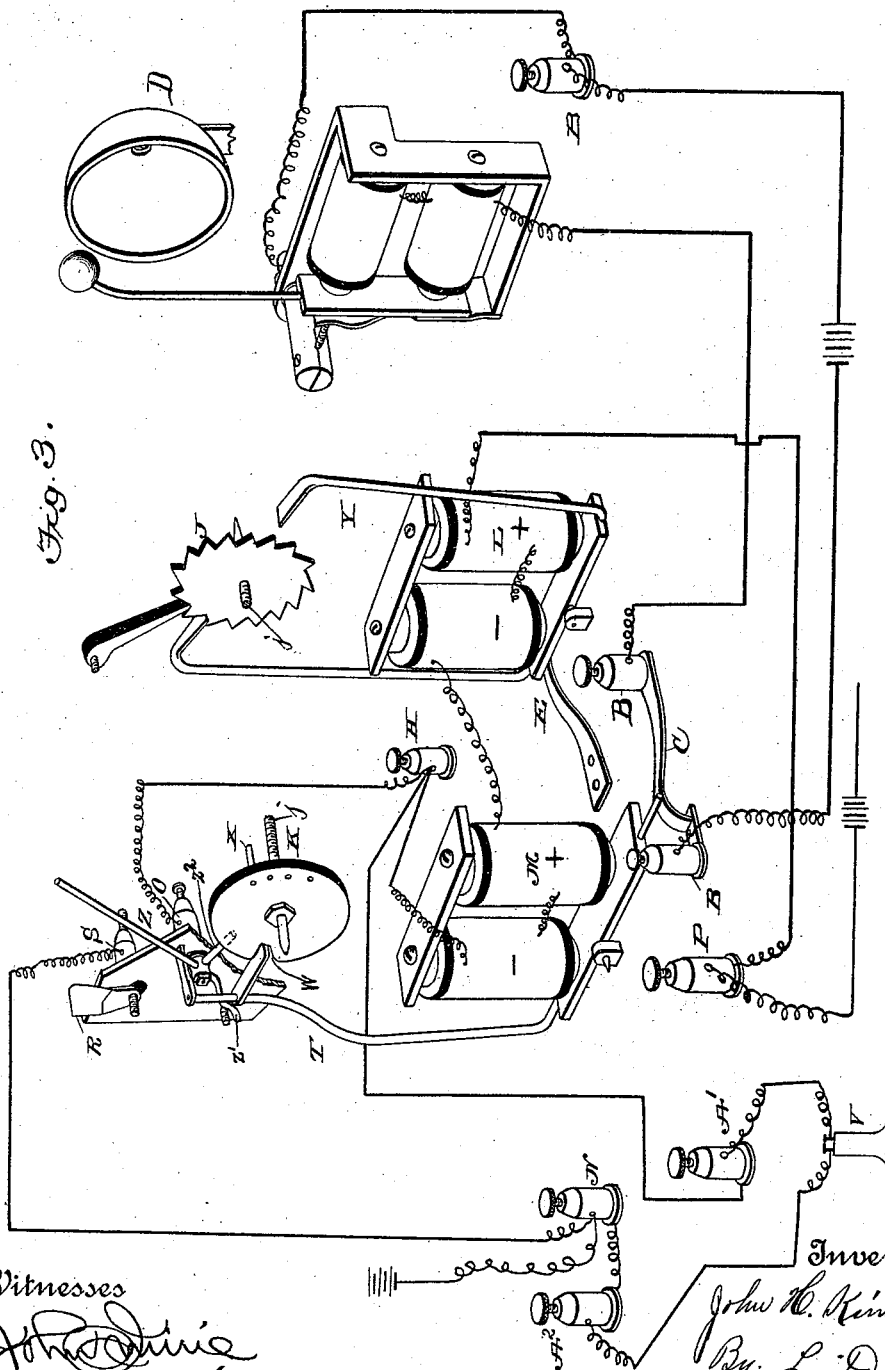
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UNITED STATES PATENT OFFICE.

JOHN H. KINSMAN, OF BRIDGEPORT, CONNECTICUT.

TELEPHONE-CALL.

SPECIFICATION forming part of Letters Patent No. 491,893, dated February 14, 1893.

Application filed January 20, 1892. Serial No. 418,703. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. KINSMAN, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Telephone-Calls; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Figure 1, is a perspective view of this invention. Fig. 2, is a similar view from an opposite side. Fig. 3, is a diagram illustrating the invention.

The object of this invention is to furnish for use upon telephonic, telegraphic and other electrical lines an apparatus by means of which upon a line serving for the use of many instruments, any single one may be called and put in connection with any other instrument or any other instruments to the exclusion of all the remaining instruments which have not been so called or connected, while at the same time the communication passing between the instruments connected cannot be overheard or interrupted by any person having access to the other instruments not so connected. To effect this one main wire, one main battery or a magneto-electric machine with a direct or continuous current is necessary for any number of instruments which may be placed upon a circuit. The local battery which is used with the transmitter of a telephone is used to ring the bell when the "local call" is put in connection. While secrecy of communication is provided for, the annoyance of listening to discover if it is one's own instrument which is called, is abolished as the special call upon one instrument has no effect upon the others and the line becomes in fact a "private line" for the persons who are using it, thus obviating the expense of many wires which are used for such purpose.

The system consists of two portions, one being situated at the central office, the other at the location of the telephone or instrument in use. The former I designate "central call," the latter "local call."

The "central call" as indicated in Fig. 1, may consist of the apparatus used for that purpose in my patent No. 334,390 of January 12, 1886, which can easily be adapted by

changing the relative positions of the springs and wires while the general construction and manner of using remains the same as therein described. Or it may consist of any mechanism by which the direction of a current can be changed at will as for example the key or a modification of it which is described in *Elementary Lessons in Electricity and Magnetism*, by Sylvanus P. Thompson, McMillan & Co., 1887, figure 161 page 403. In either case the effect upon the "local call" is the same.

The "local call" consists of the polarized relays L and M with their armatures, a toothed wheel J, actuated by means of a prolongation of the armature of relay L, a disk K, acting in connection with the arm T, of the armature of relay M, a vibrating bell D, to be rung by means of a local battery, a lever Z, to be actuated in one direction by the arm T, of relay M, and in another direction by a pin or projection upon the disk K, and of various spring-wires or other metallic connections to be used in producing the results desired from the "local call." The combined action of some of these different parts and forces results in the ringing of the bell and the placing of the telephonic telegraphic or other instruments of a pre-determined "local call" or "local calls" in connection with the line in such a manner that communication between two or more parties may take place over it while at the same time by the non-action of these parts, or at other times by the action of other parts, other "local calls" upon the line are left or placed in such a position that their bells do not ring and no communication can be heard through their receivers or other instruments.

The disk K, has near its periphery the inwardly projecting pin X, and cut in its periphery the slot W, which is placed at a certain pre-determined distance from the pin X, this distance being varied for each instrument upon the same line. The arm T, has upon it two projections one to enter the slot W, and one to throw over the lever Z. The lever Z, has three arms. One of these rests at certain times against the contact R, while of the other two the lower one Z', serves when impinged upon by the pin X, to throw the first mentioned arm away from the contact, and the upper one Z², serves under like circum-

stances to throw it against the contact. The lever Z, and the contact R, are both supported upon the same plate but are insulated from each other by any suitable material.

5 The toothed wheel J, which is actuated by pawls upon each end of the armature of the magnet L, and the disk K, are upon the same spindle j, and revolve together. The spring E, holds the armature of magnet L, and consequently the pawls in a fixed position when not in use and helps to throw back the armature when the instrument is in use and the spring C, serves the same purpose for the armature and arm of magnet M. The latter spring serves also as a means for closing the circuit of the local battery for the purpose of ringing the bell D, when the projection upon the arm T, and the slot W, are in juxtaposition, provided the corresponding pin at the "central call" is pushed down. The toothed wheel has the same number of teeth as there are pins and metallic contacts on the "central call," consequently one revolution of the wheel of the "central call" causes one revolution of the wheel and disk of the "local call." If a key is used the number of depressions should correspond with the number of teeth.

When the line is not in use the lever Z, does not touch the contact R, being thrown completely over or else resting with the lower short arm upon the pin X.

When the line is in use the levers of all the instruments rest upon the contact R, except those which are being used for communication. These are thrown away from the contact.

The slot W, in the disk K, is placed at such a distance from the pin that a number of impulses upon the toothed wheel corresponding to the number of the call will bring the slot and the projection upon the arm T, in conjunction with each other.

The combined action of the "central call" and the "local call" is as follows: When the positive current is used it passes over the line to the binding-post P, of the "local call" and to magnet L. Now one arm of the magnet L, being a north pole of the polarized relay of which it forms a part and being wound with a right-hand spiral attracts the end of the armature bearing the pawl Y and forces over for a certain distance the toothed wheel and consequently the disk. The current continues through magnet M, one arm of which is also a north pole of the relay of which it forms a part acts in a similar manner, but as the corresponding end of its armature is already raised by the spring C, there is no motion. The current continues to the binding post H, to the binding-post A', to the telephone receiver or its equivalent V, to the binding post A², to the binding post N, to earth and to the "central call." Every time that the positive current passes over the line one end of the armature or magnet L, is attracted and the toothed wheel and the slotted disk are turned a portion of the distance between the teeth.

When the current is interrupted the spring E, raises the other end of the armature and the remaining portion of the distance is passed over, so that when as many positive impulses have been sent over the line as there are teeth on the wheel J, it, and the disk K, have each made one revolution. During this operation the arm T, of the magnet M, has not been moved, the spring C, having held against the magnet the end of the armature which would have been attracted had it been free to move. During the early part of the rotation of the disk of the "local call" the pin X, striking against the lower short arm of the lever Z, has thrown it, in all the instruments, against the contact R, where it will rest during the remainder of the revolution of the disk unless thrown over by the action of the arm T. The current after leaving magnet M, runs to the binding post H, and the telephone receiver or its equivalent V, and then out of N. A wire also runs from H, to the binding post O, which connects with the lever Z, and a wire runs from the binding post S, which connects with the contact R, to the binding post N. Consequently when the lever Z, is thrown against the contact R, the current can pass directly to binding post N, and away, without passing through the telephone receiver or its equivalent V, and therefore they are out of circuit. Now let us follow the operation of putting the telephone receiver or its equivalent of one of the "local calls" in circuit.

We will take No. 8. We send the positive current eight times over the line and then send the reverse current once. At the "local calls" when the reverse current is passed over the line the current enters in a reverse order and consequently the action upon the magnets is reversed. The pawl Y, which had fallen back when the last positive current was broken, remains at rest, the end of the armature which is supported by the spring E, being the one attracted, but the end of the armature of magnet M, which carries the arm T, is attracted, the spring C, is forced down, closing the circuit of the local battery through the bell because its poles are inserted in the binding posts B, B, and the bell rings. But this can only occur because the slot W of the disk K, has been brought opposite the lower projection of the arm T, which has entered it and thus allowed the armature to press down the spring C. Of course the action of the current upon all the instruments upon the line has been the same but as it was only in instrument No. 8, that the slot in the disk was opposite the projection on the arm T, at the time that the current was sent in the reverse direction, the corresponding instrument was the only one which could respond, the slot in No. 7, for example having passed the projection upon the arm of its instrument, and the slot in No. 9, not having arrived at that position. As long as this current continues the bell of the "local call" rings. When the current is broken the spring C,

throws back to its place the arm T, the bell stops ringing and the instrument is ready for use.

Let us suppose that call No. 10 is the one with which communication is desired. Send over the line two more positive impulses and then a negative one. The same result is obtained and the bell of No. 10 rings. Discontinue the current and the arm T, falls back to its original position and the ringing ceases. The two rotations 8 and 10 can then communicate with each other. When the use of the line is finished the positive current is sent over the line a sufficient number of times to cause the toothed wheel J, to complete a full revolution. This can be easily determined by having at the "central call" a corresponding wheel inserted in the line. This completion of the revolution throws all the rest of the levers Z, away from the contacts R, all the short circuits are opened "cutting in" all the instruments and the line is in the same condition as when we started.

The magneto-electric apparatus used for calling the "central office" should be constructed so as to induce a current only in the direction of the negative current sent from the "central call." In this manner the passage of the current does not cause the toothed-wheel to rotate or disturb the position of the instrument.

What I claim is:

1. In an electrical signaling instrument, the combination with a rotatable disk provided with a stop, an electrical circuit provided with a signal and a spring contact, and a polarized relay, the armature of which engages with the stop in the disk and with the spring contact, substantially as set forth.

2. In an electrical signaling instrument, the combination with a rotatable disk, the periphery of which is slotted, an electrical circuit provided with a signal and with a spring contact, and a polarized relay, the armature of which is provided with an extension at one end for engaging with the spring and with an arm at the other end, said arm being provided with a projection for engaging with the periphery of the disk and entering the slot, substantially as set forth.

3. The "local call" composed of the polarized relay having arms to operate a toothed wheel, the toothed wheel connected with the disk, the disk having upon its surface a pin and upon its periphery a slot, the polarized relay having an arm with projections upon it, a lever Z having arms to be acted upon by the before mentioned pin and by the before mentioned arm with projections, the plates supporting the lever and the contact plate insulated from each other, the contact spring for connecting the bell with the local battery, the bell for connection with the local battery, the

springs for holding in position the armatures of the polarized relays, the conductors for connecting the different parts to each other and to the main and local batteries, substantially as described.

4. In an apparatus, as described, the combination of the slotted disk having a pin near its periphery projecting inward, with the lever Z, having three arms, a magnet, the armature of which is provided with the lever T, having two arms, one for throwing over the lever and the other for entering the slot in the wheel, and the contact surface against which one arm of lever T, rests at times, substantially as set forth.

5. The combination in an apparatus for "cutting out" or "cutting in" on a telephonic, telegraphic or other electrical line of one or more polarized relays, a toothed wheel revolved by means of the armature of one of said relays, a disk having a slot and a pin, a contact spring to close the circuit of a local battery, a lever to be thrown by the pin upon the disk, in one direction or by an arm actuated by the armature of a polarized relay in another direction when the current passes in a certain predetermined direction, said arm having upon it a projection for the purpose of entering the slot or slots upon the disk at a predetermined time, and a projection for the purpose of actuating the lever at a predetermined time, the whole actuated by an apparatus controlled by some other person than the person using the first mentioned apparatus.

6. The combination with the polarized relays and their armatures, of the toothed wheel, and peripherally slotted disk mounted upon the same shaft, the pawls, whereby a step by step movement is given to the toothed wheel, the arm having a projection operating in connection with the slotted disk, the three armed lever operated by a projection on the said arm the insulated contact plate, and the conductors, whereby a telephone may be placed in circuit, substantially as specified.

7. The combination with the polarized relays and their armatures, of the toothed wheel and peripherally slotted disk mounted upon the same shaft, the pawls whereby a step by step movement is given to the toothed wheel, the arm having a projection adapted to operate in connection with the slotted disk, the contact spring supporting one end of the armature carrying said arm, and the bell magnet and conductors arranged to operate substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN H. KINSMAN.

Witnesses:

W. C. MEAD,
JAMES H. SMITH.