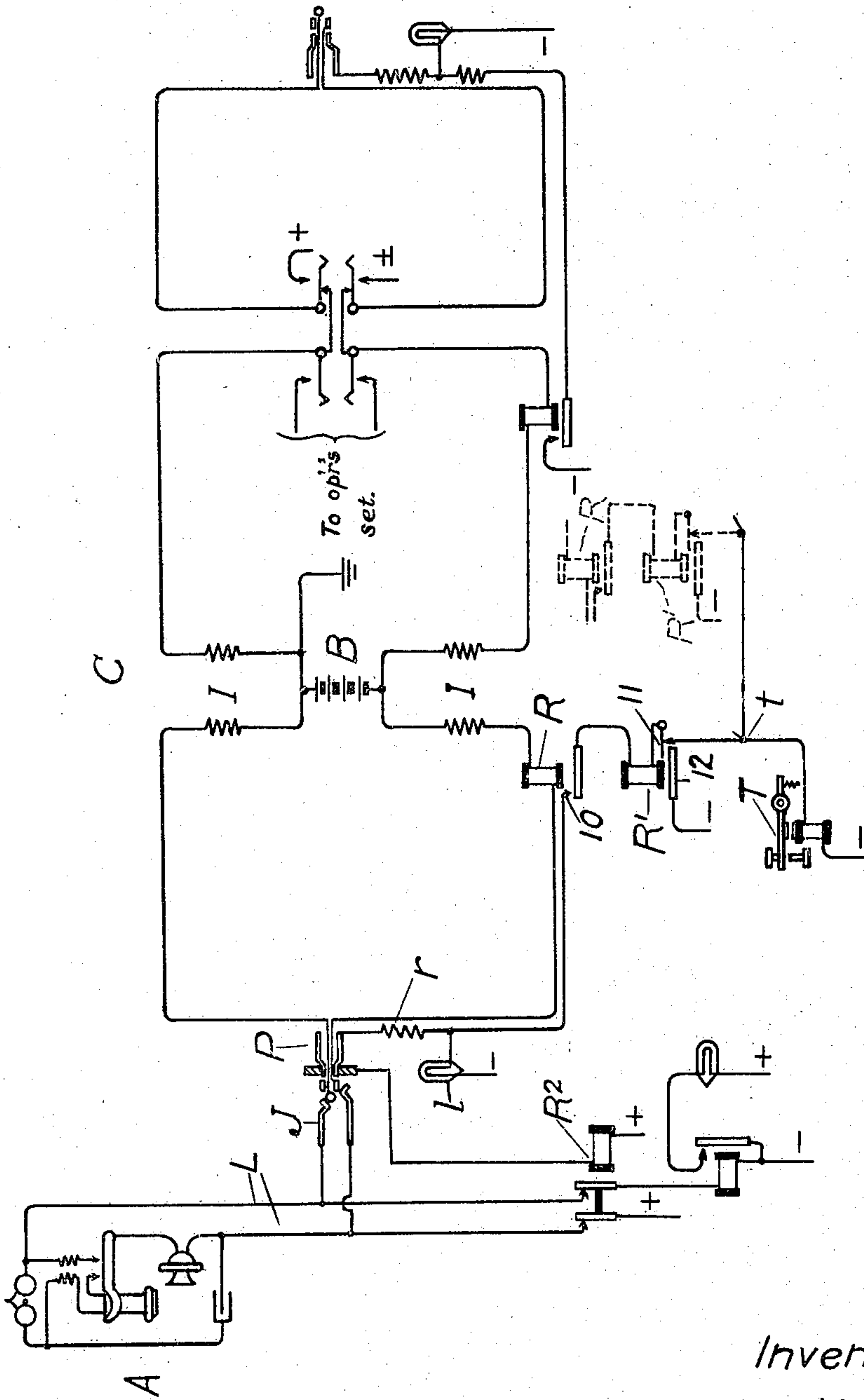


AUXILIARY SUPERVISORY SIGNAL SYSTEM.

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1,228,167.

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UNITED STATES PATENT OFFICE.

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AUXILIARY-SUPERVISORY-SIGNAL SYSTEM.

1,228,167.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HENRY M. BASCOM, residing at Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in Auxiliary-Supervisory-Signal Systems, of which the following is a specification.

In telephone exchange systems, when a subscriber during a connection attempts to recall the operator by moving the switch hook to open and close its contacts and thus flash the supervisory lamp in the cord circuit connected to the substation line, the character of the movement is frequently such that an effective illumination of the lamp is not produced, and the operator, especially during busy periods, does not notice it. By this invention an auxiliary signal, preferably audible and common to all the cord circuits at a position, is provided, which will unfailingly attract the operator's attention and which may also readily be noticed by the supervisor.

A single embodiment of the invention is illustrated diagrammatically in the accompanying drawing.

At C appears a central station connecting or cord circuit, which by its answering plug P is joined to a jack J of a line L leading to a calling substation A. Recalls being usually from the calling party, the invention will be described as applied only to this end of the cord circuit. In the ring strand of the cord is included the winding of the usual answering supervisory relay R, which by its front contact controls through the sleeve strand of the cord the extinguishment of the supervisory lamp Z, this lamp receiving current for this illumination from the central station battery B connected between the windings of the repeating coil I. Instead of the usual shunt which relay R applies to the lamp upon the closure of line L by the hook switch of substation A, there is shown a branch circuit including the winding of an auxiliary signal controlling relay R' of the make-before-break type, its break contact and the winding of an audible signal device, such as a sounder T. This signal device, which is so mounted upon the switchboard that the click which its actuation produces may be distinctly heard by the operator at the position and by the supervisor, is multiplied as indicated at t to the break contacts of all

the other relays at the same position, it being common thereto. The make contact of relay R' is joined to battery.

With the connection between the line L and the cord circuit C as illustrated, the relay R was energized from battery B when the operator inserted plug P in the jack J of the line, through windings of the repeating coil I, tip and ring strands of the cord and contacts of the plug P and jack J and the limbs of the line L. A circuit is thus closed through the winding of cut-off relay R² of the line L, sleeve contacts of the jack and plug, sleeve strand of the cord, resistance r, contact 10 of relay R, winding of relay R', break contact 11 of said relay and winding of sounder T. As the answering supervisory lamp Z is in parallel with the portion of this circuit which includes the windings of relay R' and sounder T, it is shunted thereby and remains unlighted, as is customary under the conditions stated. The relay and sounder are both energized and the attracted armature of the relay closes make contact 12 and opens contact 11, it being held energized and maintaining the shunt of the supervisory lamp through the former. On account of the severing of its circuit at contact 11, the sounder is de-energized.

Suppose now that the subscriber at substation A having finished the conversation with the subscriber called wishes a connection with another substation line and moves the switch hook down and up to open and close the line circuit. Relay R is rapidly alternately deenergized and energized by the opening and closing of the line circuit. The breaking of contact 10 upon deenergization opens the shunt of the lamp Z so that it lights. Relay R' is released, and its break contact 11 closed. This reestablishes the circuit of the sounder T as far as the armature of relay R, but said sounder is not energized on account of the gap at contact 10. The oscillation of the switch hook then again energizes relay R. As described in connection with the insertion of the answering plug, the lamp Z is extinguished and relay R' energized. The pulse of current which the sounder T receives between the closing of contact 10 and the opening of contact 11 causes it to attract and release its armature to produce a double click. This signal is repeated successively as long as the subscriber

continues to actuate the hook switch. This calls to the notice of the operator the fact that some one of her answering supervisory lamps is flashing, and therefore that a subscriber desires her attention. At the same time the signal may be heard by the supervisor, who will be able to detect negligence upon the part of the operator in responding to recalls.

From what has been set forth, it will be observed that there is a sound produced by the signal device T incidental to the operation of the system upon one change in the condition of the supervisory relay, this occurring when the operator first plugs into the jack of the calling line in answering and said supervisory relay is energized to shunt out the lamp, but that it is not sounded upon the opposite change, when the relay is released to light the supervisory lamp as the result of the return of the receiver to its hook at the termination of conversation. It is preferred to thus allow incidental operation of the audible signal upon the closure of the line circuit, since it is associated with an act of the operator and therefore may be anticipated by her, while if it came when the calling subscriber hung up the receiver attention might be attracted unnecessarily.

The invention claimed is:

1. In a telephone system, a plurality of cord circuits situated at an operator's position, a supervisory relay associated with each cord circuit, a supervisory signal controlled by each relay, electromagnetic devices adapted to be placed by the relays in parallel with the supervisory signals, and an audible signal responding first to the energization of said relays and then to the energization of said electromagnetic devices.

2. In a telephone system, a connecting circuit including a supervisory relay, a branch circuit provided with a recalling signal de-

vice, and electromagnetic means in said branch circuit operated by said relay, said signal device responding first to the energization of said relay and then to the operation of said electromagnetic means.

3. In a telephone system, a connecting circuit provided with switching elements, a supervisory relay associated therewith the energization of which is effected wholly by the connection of said elements, an electromagnetic device under the control of the supervisory relay in its energization and de-energization, and a device governed by said electromagnetic device and giving a signal upon the energization only of the supervisory relay.

4. In a telephone system, a connecting circuit including switching elements, a supervisory signal relay associated therewith, an auxiliary signal relay, a circuit for said auxiliary signal relay including said elements and a contact of the supervisory signal relay and the winding and a contact of the auxiliary signal relay, and a signal controlled by said circuit.

5. In a telephone system, a connecting circuit, a supervisory relay associated therewith, a make-before-break relay, a circuit for said relay including a contact of the supervisory relay and its own winding and break contact, signal controlled by said circuit, and a second circuit for the make-before-break relay including a contact of the supervisory relay and its own make contact.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses, this twenty-fifth day of January, 1916.

HENRY M. BASCOM.

Witnesses:

WILLIAM H. HORNER,
R. A. HAISLIP.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."