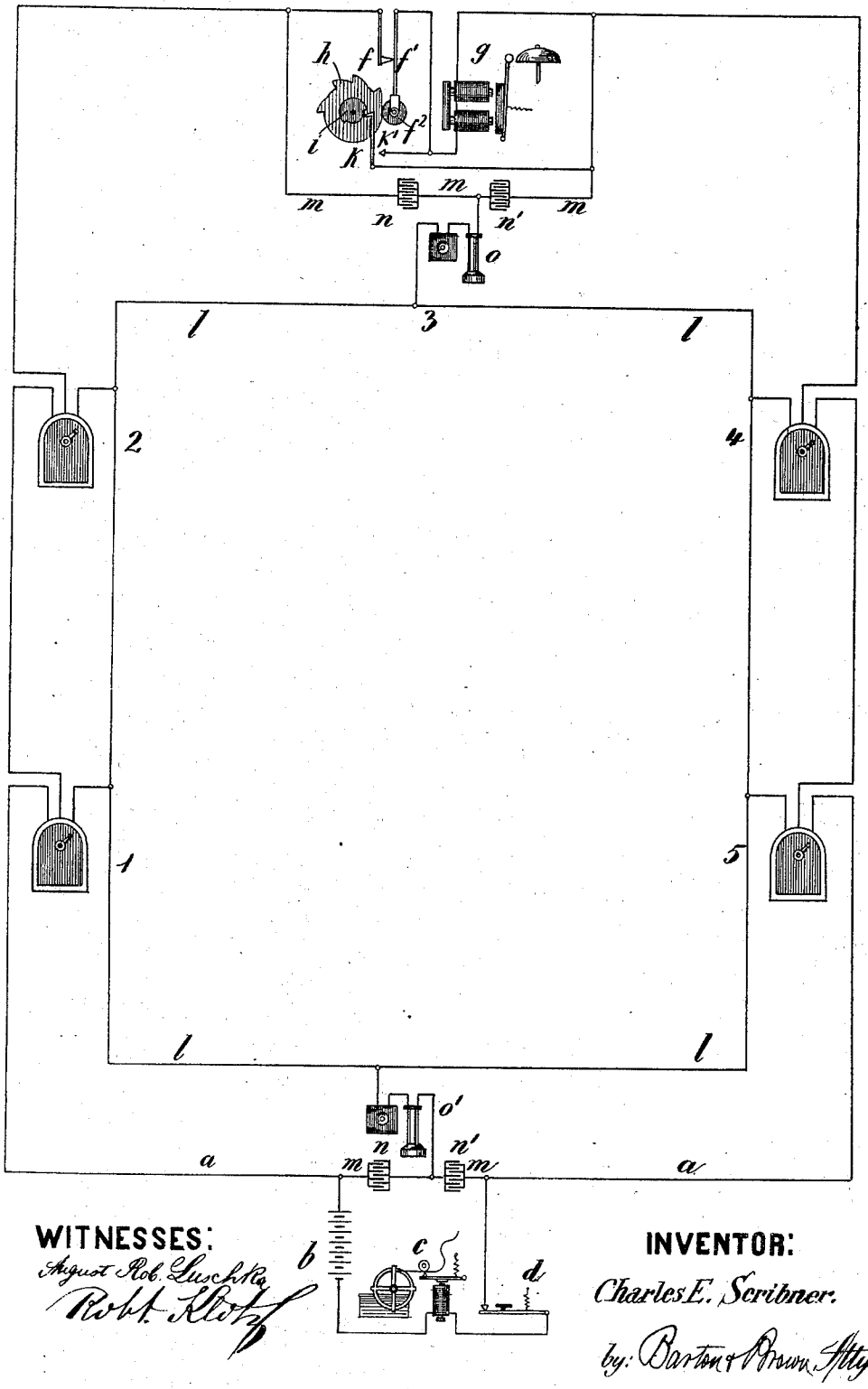
(No Model.)

C. E. SCRIBNER.

TELEPHONE CIRCUIT FOR POLICE BOXES.

No. 559,409. Patented May 5, 1896.



WITNESSES:

August Rob. Luschka

Robt. Klotz

INVENTOR:

Charles E. Scribner.

by: Barton & Brown Attys

UNITED STATES PATENT OFFICE.

CHARLES E. SCRIBNER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN ELECTRIC COMPANY, OF SAME PLACE.

TELEPHONE-CIRCUIT FOR POLICE-BOXES.

SPECIFICATION forming part of Letters Patent No. 559,409, dated May 5, 1896.

Application filed January 26, 1894. Serial No. 498,125. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. SCRIBNER, 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-Circuits for Police-Boxes, (Case No. 350,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to telephone-circuits in which telephones are placed in multiple between two line-wires, one of which wires includes an electromagnet or other resistance at each telephone-station. Its object is to eliminate the resistance of the electromagnet from the telephonic circuit while the telephone is in operation, in order to facilitate the transmission of the telephonic current and to preserve the electrostatic balance of the line-wires to avoid the effects of induction.

My invention applies particularly to police signaling systems in which a circuit from a central station through each of several stations or police-boxes includes the electromagnet of a signal-bell in each police-box and the electromagnet of a register at the central station, and a second metallic circuit of wire extends parallel with the first, a telephone being connected in a bridge between the two wires at each station. The second-mentioned wire is provided in place of an earth-return for the telephones, in order to neutralize the effects of induction from neighboring circuits carrying undulatory or alternating currents. It is common to provide means for short-circuiting the signal-bells of those police-boxes which are not in use at any time; but even in that case the bell-magnet in the box at which a telephone is in use will still be in circuit.

My invention consists in providing a shunt-circuit about the electromagnet including two condensers, the telephone being placed in a bridge extending from a point between the two condensers to the return or neutral wire. The alternating currents produced in the two line-wires by induction from other circuits are thus transmitted through both line-wires, those in the signal-box circuit being unimpeded by the condensers in the by-path about the electromagnets, so that the induced electromotive forces at the terminals of any one telephone are balanced and counteract each other in the manner well understood in telephony.

My invention is illustrated in the accompanying drawing, wherein are shown a signaling and a neutral or return circuit extending from a central station through five police-boxes, the system being provided with my invention.

The circuit *a* represents the signaling-circuit. This includes at the central station a battery *b*, the electromagnet of a register *c*, and a signaling-key *d*. It extends in series through the different police-boxes 1, 2, 3, 4, and 5. The signaling apparatus of these boxes is of the usual character and is shown diagrammatically at station 3. At that station the circuit extends through contacts *ff'* and the electromagnet of a signal-bell *g*. The contact *f'* is designed to be automatically separated from its anvil *f* when the box is set into operation by a toothed break-wheel *h*, whose spurs raise the spring *f* as they pass under the roller f^2. The spurs or teeth upon the break-wheel *h* are arranged to transmit a distinctive succession of pulsations of current in the signal-circuit. The break-wheel *h* carries a cam *i*, which controls contacts *k k'*, included in a short circuit about the signal-bell *g*, the cam being arranged to close the contact-points together during the time that the signal of the break-wheel is being transmitted. A current from battery *b* normally finds circuit over line *a*, through the contacts *f f'* in each police-box, and through the register *c* at the central station. When the break-wheel *h* is set into operation at any police-box, it causes a distinctive series of interruptions in the circuit, each break in the circuit actuating the register *c* and causing it to imprint a mark upon the register-tape. A neutral wire *l* extends parallel with wire *a* throughout its entire course, so that it is submitted at every point to the same electrical influences which affect wire *a*. At each station, including the central station, a shunt-circuit *m* is created about

the electromagnet in the circuit at that station, the shunt-circuit including two condensers n and n'. One terminal of a telephone set o is connected to a point of the circuit m between the two condensers n and n', its other terminal being connected with the neutral wire l. The condensers $n\,n'$ may be of about four-tenths microfarad capacity each. It will be observed that the shunt-circuit m is practically open as to continuous currents, so that the current from battery b in the signal-circuit is not affected by the shunt and the interruptions of the circuit produced by contacts $f\,f'$ are not interfered with. At the same time the circuit $m\,m$ forms a short circuit to the electromagnet, as that of bell g, as to alternating currents, so that the lines l and a are of practically the same resistance and impedance to such currents. Two objects are attained by including two condensers n and n' in the shunt-circuit m. If only one condenser were used, then in the event of two telephones being used at the same time the current from battery b might find circuit through the two telephones, and thus be shunted from the intermediate signal-boxes. The use of the two condensers prevents such accidental shunting. Moreover, the connection of the telephone from a point intermediate between two condensers tends to preserve more fully the electrostatic balance of the line-wire and renders more perfect the provision against noise from induced currents. In practice it is found that the disturbance in the telephone—as telephone o' at the central station, for example—is very greatly increased by short-circuiting either of the condensers n or n',

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

1. The combination with a signaling-circuit including means for transmitting intermittently-unvarying currents and a device in the circuit responsive to such currents, of a shunt-circuit about the said device including two condensers, a return or neutral wire circuit, a telephone in a bridge between the return-wire and a point on the shunt intermediate of the two condensers, and a source of telephonic current in another bridge between the signaling-circuit and the return-circuit, whereby the shunting of signaling-current from the responsive device is prevented and the resistance of the responsive device is eliminated from the telephone-circuit, as described.

2. The combination with a signaling-circuit extending to its central station and including an electromagnet there, of an electromagnetic instrument responding to intermittent unvarying currents in the signaling-circuit at the central station, and means for transmitting such intermittent currents at different substations, a neutral wire extending parallel with the signaling-circuit, telephones adapted to be connected between the neutral wire and the signaling-circuit, a shunt-circuit about the electromagnet at the central station including two condensers, and a telephone connected from the neutral wire to a point on said shunt-wire intermediate between the condensers, substantially as described.

3. The combination with a police-box containing a break-wheel and its contact-points and the electromagnet of a signal-bell, included in a signaling-circuit connected with a central station, of a shunt-circuit about the police-box including two condensers, and a telephone connected from a point of said shunt-circuit between the two condensers, the other terminal of the telephone being connected to a return-conductor to the central station, substantially as described.

4. The combination with a signaling-circuit including police-boxes at substations and an electromagnet of a register at a central station, of a neutral wire extending parallel with the signaling-circuit, a shunt-circuit about the signaling appliances at each station, said shunt-circuit including two condensers, and a telephone bridged between the neutral wire and each shunt-circuit at a point intermediate between the condensers.

In witness whereof I hereunto subscribe my name this 11th day of January, A. D. 1894.

CHARLES E. SCRIBNER.

Witnesses:
ELLA EDLER,
DUNCAN E. WILLETT.