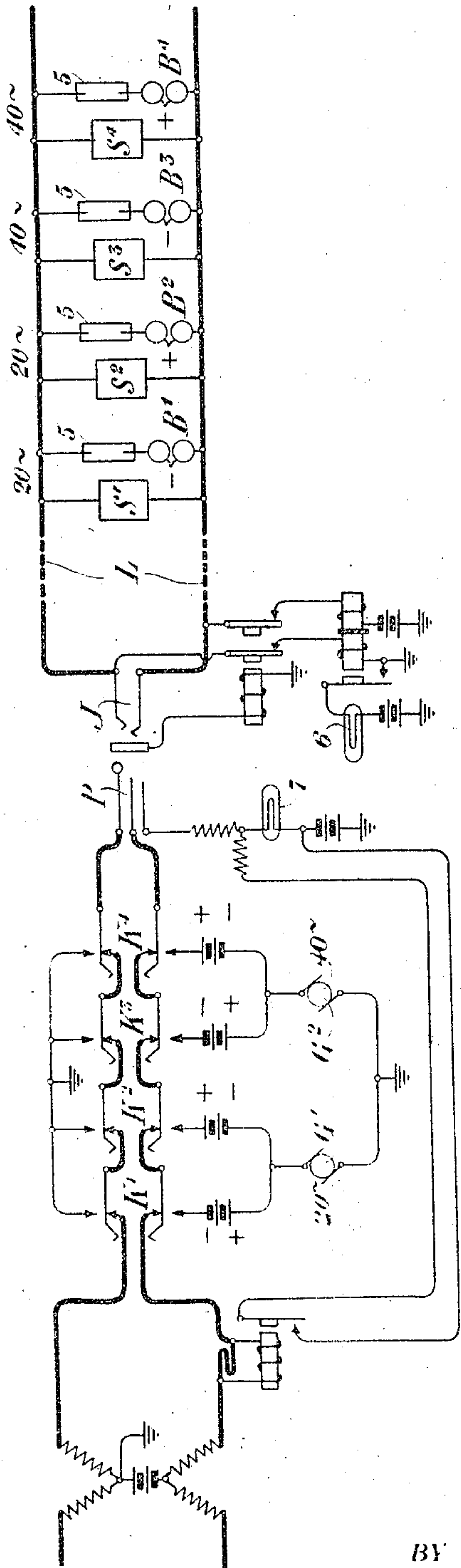


Dec. 23, 1924.

1,520,097

G. K. THOMPSON
SELECTIVE SIGNALING SYSTEM

Filed Dec. 3, 1923



INVENTOR

G. K. Thompson

134'

ATTORNEY

UNITED STATES PATENT OFFICE.

GEORGE K. THOMPSON, OF MAPLEWOOD, NEW JERSEY, ASSIGNOR TO AMERICAN TELEPHONE AND TELEGRAPH COMPANY, A CORPORATION OF NEW YORK.

SELECTIVE SIGNALING SYSTEM.

Application filed December 3, 1923. Serial No. 676,251.

To all whom it may concern:

Be it known that I, GEORGE K. THOMPSON, residing at Maplewood, in the county of Essex and State of New Jersey, have invented certain Improvements in Selective Signaling Systems, of which the following is a specification.

This invention relates to selective signaling systems, and more particularly to systems of the character which are adapted for use in connection with multi-station telephone lines.

It is an object of this invention to provide means for selectively signaling over a common battery line by the use of currents differing in frequency and polarity without necessitating the grounding of the line conductors through apparatus at the subscribers' stations.

This object of the invention and certain other features thereof set forth below are attained as described in the following specification, which has reference to a certain specific embodiment of the invention illustrated in the accompanying drawing, in which—

The figure is a diagrammatic view of one form and arrangement of circuits embodying the invention.

The reference character L in the drawing designates a telephone line having associated therewith four subscribers' substations S¹, S², S³ and S⁴, which may be of any of the types commonly employed, and which are shown conventionally in the drawing for simplicity. Associated with the substations and bridged across the line conductors are signaling devices illustrated as bells or polarized ringers, B¹, B², B³ and B⁴ the former two of which are responsive only to current of one frequency, herein assumed as 20 cycles, and the latter two of which to current of another frequency, 40 cycles, it being understood that other suitable frequencies may be used. Bells B¹ and B³ are biased negatively, i. e., so constructed that they respond only to periodic currents of negative polarity, and bells B² and B⁴ are biased positively. In series with the bells are electrical discharge tubes 5 which are of such construction that they will present an open circuit to low voltage direct current used for actuating the usual supervisory signal 6 and the line signal 7 at the central office, and will break down and allow to pass through them the high volt-

age polarized periodic current used to operate the bells bridged across the telephone line. This arrangement serves to prevent the flow of central office battery current through the bells, which would otherwise cause decreased marginal operation of the line and supervisory signal circuits, and on the other hand, it will allow ringing currents which have a higher voltage to operate the bells. The line L terminates at the central office in a jack J, which is adapted to receive the plug P of an operator's cord, only one terminal of which has been illustrated in the drawing, it being understood that the cord is equipped with the usual common battery and supervisory signaling apparatus. The cord is also provided with a set of keys K¹, K², K³ and K⁴ arranged for signaling selectively to the subscribers' substations S¹, S², S³ and S⁴, respectively. Keys K¹ and K² are respectively connected to negatively and positively poled batteries in series with 20 cycle alternating current, to form negative and positive polarized periodic current and the current for keys K³ and K⁴ is of a similar nature, except that the alternating current component has a frequency of 40 cycles. The keys for this purpose are associated with generators G¹ and G², which may be of a commercial type. The frequency of generator G¹ corresponds to that of bells B¹ and B², and the frequency of G² corresponds to that of B³ and B⁴, as indicated in the drawing.

To ring the subscriber's station S¹, the operator associates the plug of her cord with the jack J, and depresses the key K¹, so that negative current of a frequency of 20 cycles flows over the line L and through the bells. The bells B³ and B⁴ fail to respond because of the frequency of the current, and bell B² fails to operate because it is biased against current of negative polarity. The bell B¹, however, being of the right periodicity and bias, responds to the current. The other substations on the line may be signaled selectively in a similar manner by the remaining keys.

It will be observed that because of the connection of the bells across the line conductors, inductive disturbances are avoided which would be present under certain line conditions if the bells were connected to ground.

While the arrangements of this invention

have been illustrated as embodied in certain specific forms which have been deemed desirable, it will be understood that they are capable of embodiment in many and 5 widely varied forms without departing from the spirit of the invention as defined in the appended claims.

What is claimed is:

1. In a selective signaling system, line 10 conductors, biased frequency selective signaling devices associated therewith adapted to be operated by polarized periodic current, direct current responsive means associated with said line, and means for impressing 15 polarized periodic current of different frequencies upon said line to operate said selective signaling devices, means for impressing direct current of lower voltage than the polarized periodic current upon said line to 20 operate said responsive means, and electrical discharge tubes in series with the signaling devices, said tubes being of such construction that they will present an open circuit to the direct current for operating said re- 25 sponsive means and will break down and allow to pass through them the higher voltage polarized periodic current used to operate said signaling devices.

2. In a telephone system comprising a 30 central station having line and supervisory signals, line conductors, a plurality of substations bridged across said conductors, a source of direct current for said line and supervisory signals and for said stations, a 35 plurality of sources of polarized periodic current of different frequencies, a signaling device associated with each station in bridged relation to said conductors, certain of said signaling devices being responsive 40 to polarized periodic current of one frequency and others to current of another frequency, and an electrical discharge tube in series with each of said signaling devices

which will present an open circuit to direct current below a critical voltage and 45 will break down and thereby permit the passage of polarized periodic current of higher voltage.

3. In a telephone system comprising a central office, line and supervisory signals there- 50 at, a source of direct current for said signals, line conductors, a plurality of biased signaling devices bridged across said conductors, certain of said devices being responsive to current of one frequency and others 55 to current of another frequency, electrical discharge tubes in series with said signaling devices, a plurality of sources of polarized periodic current for said signaling system, certain of said sources being of one fre- 60 quency and other of said sources being of another frequency, said electrical discharge tubes being of such construction that they will present a substantially open circuit impedance to the direct current used for oper- 65 ating said line and supervisory signals and will break down and allow to pass through them the current used to operate the biased signaling devices.

4. In a selective signaling system, biased 70 signaling devices associated therewith, one pair of said signaling devices being directly selective to one frequency and the other pair being selective to another frequency, and 75 respective electrical discharge tubes in series with said devices, said tubes being of such construction that they will present a substantially open circuit impedance to direct current and will break down and allow to 80 pass through them the polarized periodic current of higher voltage used to operate the biased signaling devices.

In testimony whereof, I have signed my name to this specification this 30th day of November, 1923.

GEORGE K. THOMPSON.