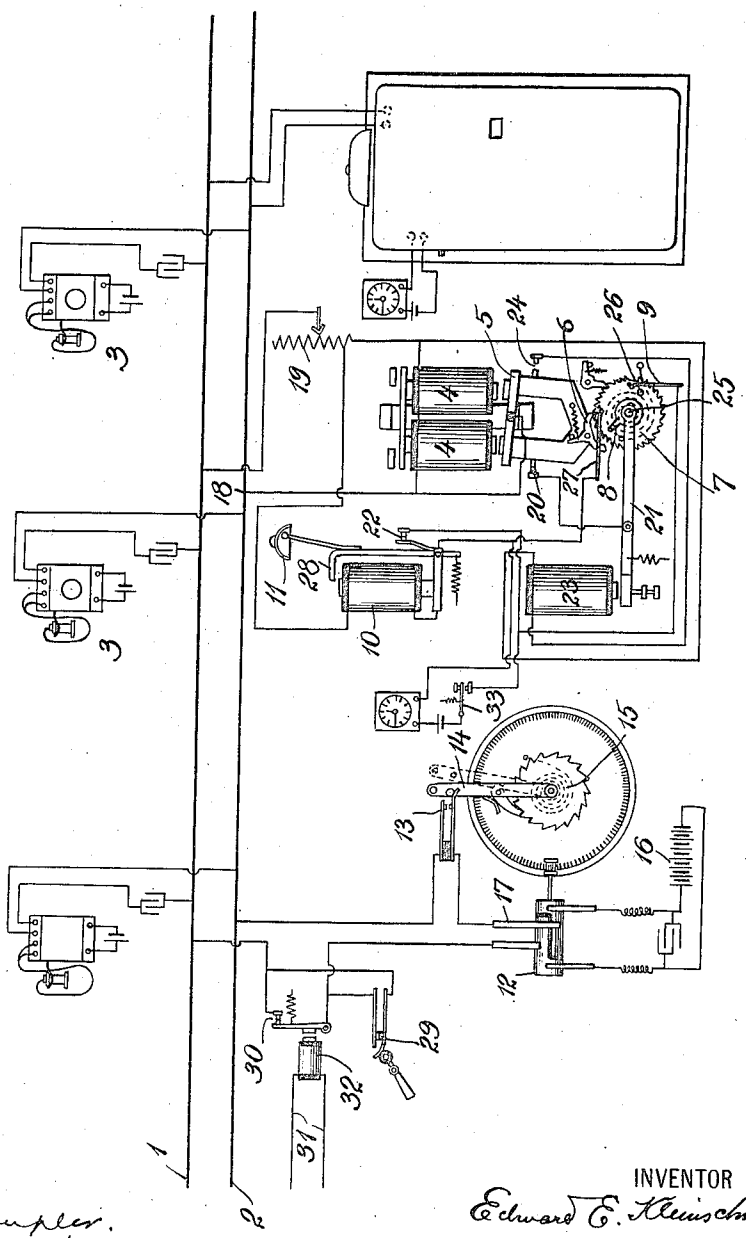
E. E. KLEINSCHMIDT.

SELECTIVE SIGNALING SYSTEM.

APPLICATION FILED APR. 7, 1913.

1,140,378.

Patented May 25, 1915.



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SELECTIVE SIGNALING SYSTEM.

1,140,378. Specification of Letters Patent. Patented May 25, 1915.

Original application filed February 25, 1910, Serial No. 545,808. Divided and this application filed April 7, 1913. Serial No. 759,482.

To all whom it may concern:

Be it known that I, EDWARD E. KLEINSCHMIDT, a citizen of the United States, residing at New York city, borough of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Selective Signaling Systems, of which the following is a specification.

The object of the present invention is to combine a time signal circuit with a selective signaling system whereby the circuits of the signaling system are utilized for receiving time signals. To that end I provide means by which the despatcher who is in charge of the selective system may prepare the circuits thereof to receive the time signals. As is well known in systems transmitting time signals, the observatory, from which the impulses are sent, is connected up with telegraphic circuits throughout the country and in the operation of the herein-described system the practice is for the despatcher to prepare the circuits of the selective signaling system at the local stations a brief period before a designated time, usually twelve o'clock noon.

The present application is a division of my application Serial No. 545808, filed February 25, 1910.

The invention will be understood from the following description taken in connection with the accompanying diagrammatic view.

Any well known selective system may be used to operate the time signal circuit arrangement and I have, for the purpose of illustration, shown sufficient of the system forming the subject-matter of my said application which may be briefly described as follows. 1 and 2 designate the conductors of a main line circuit onto which local stations are bridged, two stations being indicated in the drawing. These local stations include a telephone equipment 3 bridged on the main line circuit. Also bridged onto the main line circuit is a selector circuit by means of which a call operator may selectively signal the desired local station. Each local selector circuit includes a pair of magnets 4, 4 and a polarized armature 5 therefor pivoted at its center. Carried by this armature and operated thereby is a pivoted pawl 6 adapted, when the magnets are energized, to engage a ratchet wheel 7. Carried by the ratchet wheel is an adjustable contact 8 which, when the ratchet wheel is given a step-by-step movement, will close a signaling circuit through contact 9. This signaling circuit includes a magnet 10 which when energized by continuous current operates continuously a signal, in the particular instance shown a vibrating bell 11. The purpose of this signal in the operation of the selective system is to indicate to the local station that the despatcher desires to communicate with it by telephone. In the operation of the time signal system this bell is operated intermittently upon the coming in of the current impulses from the observatory.

Normally there is no current on the main line circuit, and in the particular system shown by me it is necessary to first close the main line circuit and to impress reversals of the current thereon for the purpose of stepping the ratchet wheel 7. This is accomplished as follows. At the central or despatcher's station is a commutator 12 in the circuit of which are contacts 13 normally held open by a stop on lever 14 forming part of a controller. When this lever 14 is moved to the right, contacts 13 will be closed, thereby impressing a current of definite polarity on the main line circuit, the impulse acting to restore all of the selectors to normal position, as will be presently explained. The despatcher throws lever 14 to a designated point for the local station to be called, and when the lever is released it is restored, by means of a spring 15, to its normal position, and while returning to its normal position commutator 12 will be operated to send reversals over the main line circuit necessary to step the ratchet wheel of the selected station to position to engage the corresponding contact 9. The circuit at such time may be traced as follows: from battery 16 through commutator brush 17, contacts 13, line conductor 2, point 18, magnets 4, resistance 19 to conductor 1. When the reversals are thus impressed on the main line circuit the magnets 4, 4 at all of the local stations will be energized and their polarized armatures operated to effect a step-by-step movement of the corresponding ratchet wheels. Only at the selected station, however, will the contacts 8 and 9 be closed, and

this will occur on the return movement of lever 14 before said lever reaches its normal position, which would open contacts 13. To prevent the complete return of lever 14 to normal position I provide a stop which will arrest its movement when in the position shown in dotted lines in the drawing, thus permitting contacts 13 to remain closed to effect the operation of the signal the circuit of which may be traced as follows: from point 18 through polarized armature 5, closed contacts 20, lever 21, contacts 8 and 9, make and break contact 22, magnet 10, resistance 19, to line. When the signal at the local station is thus operated the station called communicates through the telephone with the central station or despatcher's office, the latter, as soon as telephonic communication is established, releasing lever 14 from its arrested position, shown in dotted lines, thus permitting said lever to resume normal position and open contact 13.

All of the selectors will be operated when reversals are set over the line, but at only one will the contacts 8, 9 be closed, as well understood, and they will remain in the positions to which they are set until the closing of the main line circuit at the beginning of the next call, that is on the movement of controller lever 14 to the right. This movement sends a prolonged impulse to energize the circuit of a restoring magnet 23 as follows: from battery 16, brush 17, contacts 13, point 18, armature 5, contacts 24, which will be closed when magnets 4 are energized, to magnet 23, resistance 19, to line. The current will be of such polarity as to close contacts 24 and when the circuit just described is closed magnet 23 will be energized to operate its pivoted armature lever 21 to move the corresponding ratchet wheel 7 out of engagement with the actuating pawl 6. When the ratchet wheel is thus disengaged a spring 25 restores it to normal position.

As above stated, the purpose of the present invention is to utilize the circuits of a selective system to receive time signals, such time signals coming from a standard observatory and received at the local stations along the line over circuits prepared at the central or despatcher's station. To enable the despatcher in charge of the selective system to prepare the circuits for the time signals I provide on the side of each ratchet wheel a contact 26 placed at the same point on each wheel. The controller lever 14, when moved to a certain designated position for the time signal, will, on its return movement, step all of the ratchet wheels an equal distance to close contacts 26 and 27 in a circuit which also includes the signal magnet 10 but not the make and break contacts 22, the said circuit being as follows: battery 16, brush 17, contacts 13 which remain closed as long as lever 14 remains in its arrested position shown in dotted lines, to line conductor 2, point 18, armature 5, closed contacts 20, lever 21, contacts 26, 27, magnet 10, resistance 19, to line. When magnet 10 is thus energized its armature 28 will be attracted, but the bell clapper is so fixed thereto that the bell will be rung only upon the opening of the circuit. The circuits being thus prepared and the lever 14 arrested in the position shown in dotted lines, the despatcher opens a switch 29, located at his office, to thereby open a shunt around relay contact 30 included in the battery circuit. Contact 30 is normally closed and is opened upon the coming in of an impulse over standard time circuit 31 energizing the relay 32. The make and break of contact 30 will transmit impulses over the prepared circuits to ring the bells 11, a single stroke being given for each impulse. The usual practice is for the observatory a few seconds before the designated time to send in a series of impulses which will effect the ringing of bells 11 on the breaking of each impulse, and then to send the final impulse after the lapse of a few seconds. In addition to giving the time signal described I may also synchronize a master clock at the local stations. For this purpose I include them in a local battery circuit controlled by a switch 33 which is closed by the operator during the interval after the series of impulses and before the final impulse. The clock circuit also includes the make and break contacts 22 which are closed on the breaking of the final impulse, thus completely closing the circuit through the clock mechanism. Of course it will be understood that the bells 11 may be operated and the clocks synchronized on the forward stroke of the armature of magnet 10. This would necessitate merely the placing of the contacts 30 so that they will be closed when relay 32 is energized instead of when deënergized. Although I have shown the magnets 10 energized by current from the main line circuit, it may be energized from a local battery by connecting one pole with armature 5 and the other pole with the winding of magnet 10. In such case the wire from magnet 10 to resistance 19 would be disconnected. When reversals are being sent over the line to step ratchet wheel 7, contacts 20 and 24 will be alternately opened and closed, but the contact is not of sufficient duration to energize either magnet 10 or 23. While I have described the line circuit as being normally deënergized it is obvious that the system may be worked with a line circuit normally carrying current.

What I claim and desire to secure by Letters Patent of the United States is:—

1. In a system of the character described, a despatcher's station and a plurality of

local stations, including signaling devices, a main line uniting said stations, selectors bridged on said line and adapted to connect all the signals to said main line simultaneously, a time circuit and means for associating said time circuit with said main line.

2. In a system of the character described, a main circuit, a main station and a plurality of substations connected by said circuit, a signaling circuit bridged onto the main line at each substation, a circuit closer for closing each signaling circuit, a step-by-step mechanism for operating the circuit closer, a time signal circuit and means controlled by the step-by-step mechanisms for connecting all the signaling devices to the main circuit simultaneously and means at the main station for associating the time circuit with said main circuit.

3. In a system of the character described, a central and a plurality of substations, a main circuit uniting said stations, a signaling circuit at each substation bridged onto the main circuit, a time circuit, a selector circuit, a circuit closed for each said signaling circuit, magnets for operating said circuit closers whereby said signals are simultaneously connected to the main circuit for single stroke operation in response to impulses on said time circuit.

4. In a system of the character described, a main circuit, a signaling circuit bridged onto the main circuit, a circuit closer for closing the signaling circuit, a step-by-step mechanism for operating the circuit closer, a time signal circuit, means for associating the time signal circuit with the main circuit, and means controlled by the step-by-step mechanisms for connecting all the signals to the main line for simultaneous single stroke operation in response to impulses on said time circuit.

5. In a system for receiving time signals, a despatcher's station and a plurality of local stations, a main line circuit connecting said stations, circuits at the local stations bridged on the line circuit and including a signal, and means at the despatcher's station for preparing the circuits at the local stations to receive time signals and for associating the standard time circuit with the line circuit.

6. In a system for receiving time signals, a despatcher's station and a plurality of local stations, a main line circuit connecting said stations, selective signaling devices bridged on said main line circuit at the local stations, and means at the despatcher's station for selectively calling a local station and also for preparing the selector circuits to receive a distinctive time signal simultaneously at all the substations.

7. In a system of the character described, the combination of a main station and a plurality of substations united by a main circuit, a time circuit, a vibrating bell at each substation, electrical means for operating said bell either continuously on continuous current, or intermittently on current impulses, circuits for said means, a selector at each receiving station adapted, in response to differing impulses, to close the respective circuits for said means, whereby the bell may be caused to operate as specified either on continuous current or current impulses, mechanism for operating the selector to close either of said circuits and for sending the character of current to which said bell is responsive when the selector is so operated, said bell being operated intermittently in response to impulses from said time circuit.

8. In a system of the character described, the combination of a main station and a plurality of substations, a main circuit uniting said stations, a time circuit, a selector at each substation, a signal adapted to give two different indications under the control of each selector, means at the main station for selectively causing said signal to give a continuous vibratory signal, means for associating said time circuit with said main circuit and causing all of the said signals to respond simultaneously and give a single stroke indication in response to impulses in said time circuit.

9. In a selective signal system, the combination of a main and a plurality of substations, a main line uniting said stations, a time circuit, a selector at each substation, a bell at each substation adapted to give signals of two characters thereat, the signals of one character being given selectively, and those of the other character being given simultaneously at all the substations in response to impulses in said time circuit.

10. In a selective signal system the combination of a main station and a plurality of substations, a main line uniting said stations, a time circuit and a single signal at each substation adapted to give a protracted signal and a single stroke signal, a selector at each substation controlling the signal thereat, whereby said signals may be selectively operated to give a protracted signal and simultaneously operated at all the substations to give a single stroke indication in response to impulses in said time circuit.

11. In a signal system comprising a signal-sending station and a plurality of substations, a line circuit uniting said stations, signal apparatus including a step-by-step device at each substation having a single means to give both a protracted vibratory signal and a single stroke signal, a time circuit, means at the sending station for selectively calling a given station to give a protracted signal thereat and means at the sending station for controlling the substation signal means, whereby a single stroke signal is given at all the substations simultaneously

in synchronism with impulses in said time circuit.

12. In a signal system, the combination with a sending and receiving station of a vibrating bell at said receiving station, electrical means for operating said bell either continuously on continuous current, or intermittently on current impulses, circuits for said means, a selector at said receiving station adapted, in response to differing impulses, to close the respective circuits for said means whereby the bell may be caused to operate as specified either on continuous current or current impulses, mechanism for operating the selector to close either of said circuits and for sending the character of current to which said bell is responsive when the selector is so operated.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

EDWARD E. KLEINSCHMIDT.

Witnesses:
M. E. McNINCH,
CHARLES S. JONES.

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