

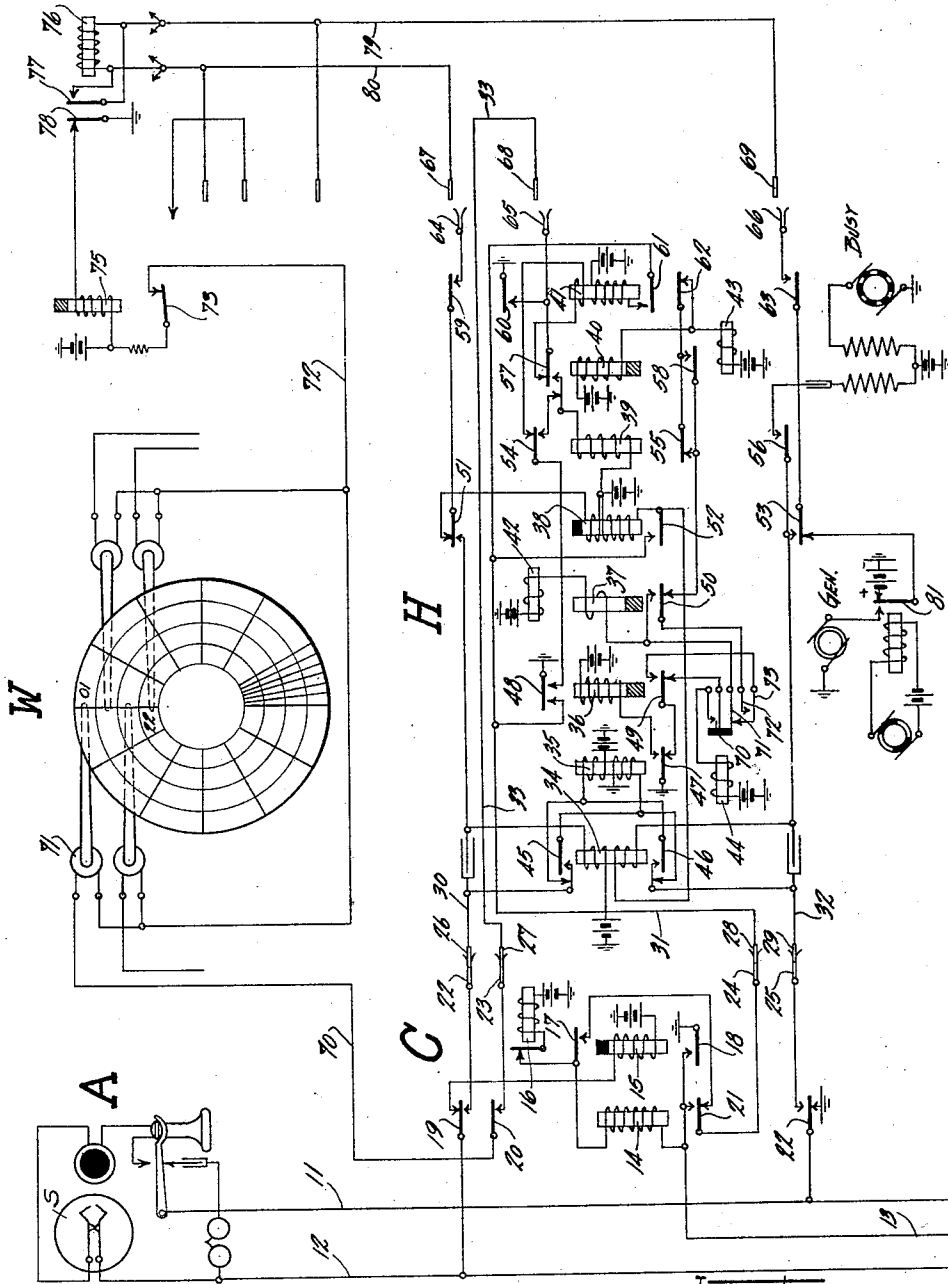
March 17, 1925.

1,529,902

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WATCHMAN'S SERVICE

Filed March 16, 1922



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Patented Mar. 17, 1925.

1,529,902

UNITED STATES PATENT OFFICE.

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WATCHMAN'S SERVICE.

Application filed March 16, 1922. Serial No. 544,308.

To all whom it may concern:

Be it known that I, DONALD R. MIDDLETON, a citizen of the United States of America, and a resident of Detroit, Wayne County, and State of Michigan, have invented certain new and useful Improvements in Watchmen's Service, of which the following is a specification.

This invention relates in general to an improved system of watchman's service and more specifically to an improved method of supervising the rounds and reports of a watchman in a large plant or company by means operated by and controlled over the lines of a local or private automatic telephone system.

Among the objects of this invention are to provide an efficient and inexpensive system of watchman's service which accurately records the time and place of a watchman's report and also allows the rounds of the watchman to be varied at will. Other objects are to provide a tone which informs the watchman that he has dialed the proper number to record the call; and to so arrange the system that should any telephone allotted for the watchman's rounds be used for a regular call after working hours by some person working overtime, the using of said telephone for said call would not cause false recording on the watchman's chart.

There are other objects which together with the above will be described hereinafter, reference being had to the accompanying drawing in which sufficient of the apparatus in an automatic telephone system is shown to enable the invention to be explained and understood.

Referring to the drawing, the reference character A indicates an automatic telephone substation of the ordinary type having the usual calling device S for controlling the automatic switches at the exchange. The reference character C indicates a line-switch individual to substation A and which is of the well known rotary type in which the wipers have no normal position and move in a forward direction only. In a system of this size there are usually from 50 to 100 telephones or substations each one of which has an individual line switch. The line switches have common access to a group of 10 or more connectors, one of which is indicated by the reference character H. The latter switches are of the well known Strö-

ger vertical and rotary type and have access through their bank multiples to all of the substations.

To the right of the connector H are shown a portion of the connector bank multiples of number 00. The private normal, instead of being multiplied from connector bank to connector bank in the usual manner, is cut at each connector bank and an individual lead, such as conductor 33 for instance, is run from the test contact or private normal of number 00 in each connector bank to the banks of the rotary line switches, where they are multiplied in the same manner as are the other trunk conductors. A relay, relay 76 in this instance, is bridged across the line bank multiples of number 00 in place of the customary line switch and substation which ordinarily would be allotted to that number. The number 00 in this instance, has been set aside as the code number for the night watchman for recording his rounds.

The reference character W indicates a time recording clock which may be of the Holtzer Cabot magnet type having a chart that revolves once in every 24 hours. The chart is cut up in sections representing the time by radial lines and is also provided with as many concentric circles as there are watchmans' stations in the factory. Thus each watchman's station is provided with a circular space on the chart for recording the calls, designated "01", "22", etc., which numbers correspond to the numbers of the telephones to be used by the watchman on his ground. Individual magnets are provided at the time recording clock for each watchman's station and each magnet is allotted to one of the circular spaces. Each magnet has an individual lead, such as conductor 70, which is individual to the line switch allotted to the corresponding telephone station, and each magnet has an armature adapted to mark the time on the chart in its own circular space. For instance, when the magnet 71 is energized by the night watchman by his calling the number 00 from the telephone #01, or substation A, the armature of said magnet is operated to prick the chart in the circular space 01 on the radial line representing the same time that the call was made. The other magnets are operated from their respective telephone stations by the night watchman in a manner

similar to magnet 71. As it is not necessary that every telephone in the factory be used as a watchman's station only certain specified telephones in different parts of the factory are wired as illustrated.

Having described the apparatus briefly I will now proceed to point out more in detail the novel features of the invention by explaining the operation thereof. For this purpose it will be assumed that the night watchman in making one of his rounds reaches telephone #01 shown at A in the accompanying drawing. When the receiver is removed at the calling station A a circuit is completed over the conductors 11 and 12 for the line relay 15 of the line switch C. Upon energizing, relay 15 closes a circuit at its armature 18 which includes the winding of the switching relay 14 and the stepping magnet 16 in series; and at its armature 17 connects the test wiper 24 to the above circuit at a point midway between the switching relay and the stepping magnet. The operation now depends upon whether the trunk line with which the line switch wipers are associated is busy or idle. If the trunk line is busy there is a ground potential upon the test contact with which the test wiper 24 is in engagement; the switching relay 14 is short circuited; and the stepping magnet 16, which interrupts its own circuit, is operated in the manner of a buzzer to advance the switch wipers in search of an idle trunk line. However, we may assume in the present case that when the call is initiated the trunk line upon which the wipers of the line switch are standing is idle. Under these circumstances when the line relay 15 is energized the switching relay 14 is not short circuited and the stepping magnet is not operated because of the high resistance of said switching relay. The latter relay, however is energized. When the switching relay 14 is energized, the test wiper 24 is grounded at armature 21, the circuit for the time clock is prepared at armature 20, and at armatures 19 and 22 the line conductors 12 and 11 are disconnected from the winding of line relay 15 and ground respectively and are extended by way of wipers 22 and 25, bank contacts 26 and 29, conductors 30 and 32, normally closed contacts of the reversing relay 34 of connector H to the upper and lower windings of the double wound line relay 35. The line relay 35 is immediately energized and its armature 47 and its working contact an energizing circuit for the slow acting release relay 36 is completed. The latter relay prepares the connector switch H for the vertical operation and grounds the release trunk conductor 31 in order to guard the trunk against intrusion and also to hold the line switch C in its operated position.

The watchman may now operate the call-

ing device for the first digit of his code number or 0. As a result the line relay 35 is deenergized 10 times. Each time the line relay 35 deenergizes armature 47 sends an impulse of current to the vertical magnet 42 in series with the slow acting relay 37 by way of the following circuit: From ground through armature 47 and its resting contact, armature 49 and its working contact, off normal spring 73, off normal spring 71, winding of relay 37, and winding of vertical magnet 42 to battery. By the operation of the vertical magnet the wipers 64-66 inclusive, are raised step by step until they stand opposite the tenth level of bank contacts. It is in this level that the code number 00 terminates. The slow acting series relay 37 is energized in series with the vertical magnet and by means of its armature 50 the circuit of the vertical magnet is maintained intact after the operation of the off normal springs, which are operated at the first vertical step. At the end of the vertical movement the slow acting relay 37 is deenergized and the operating circuit is transferred to the rotary magnet 43.

The watchman will now operate the calling device in accordance with the last digit 0 of the code number. When the calling device is operated the line relay 35 is again deenergized ten times, and the rotary magnet 43 is operated a corresponding number of times over the following circuit: From ground by the way of armature 47 and its resting contact, armature 49 and its working contact, off normal spring 73, off normal spring 72, armature 50 and its resting contact, resting contact of armature 55 and said armature, armature 62 and its resting contact, and rotary magnet 43 to battery. By the operation of the rotary magnet the wipers 64-66 inclusive, are rotated step by step until they come to rest on the tenth set of contacts in the level opposite which they were raised. These bank contacts are indicated in the drawing by the numerals 67-69 inclusive, and are the bank contacts of the code number 00. The slow acting relay 40 is energized in multiple with the rotary magnet and maintains its armatures attracted throughout the rotary movement. At armature 57, the test relay 39 is connected with the test wiper 65, and at armature 58 a shunt around armature 55 is closed. The latter operation is to prevent the test relay from opening the rotary magnet circuit while the test wiper is passing over busy test contacts. The slow acting relay 40 is deenergized after the rotary movement and a circuit for the switching relay 41 is completed at armature 57 as follows: From ground by the way of armature 48 and its right hand working contact, armature 54 and its resting contact, upper winding of

said switching relay 41, resting contact of armature 57 and said armature, test wiper 65, test contact 68, conductor 33, rotary line switch bank contact 27, wiper 23, working contact of armature 20 and said armature, conductor 70, winding of clock magnet 71, conductor 72, and the working contact of armature 73 and said armature to battery. It is optional whether the clock magnet 71 energizes in series with the switching relay or not, as the switching relay, when it energizes, grounds the test wiper 65 at its armature 60 and its working contact which in turn causes the clock magnet 71 to operate and prick the chart as formerly explained. When the switching relay 41 energizes, it establishes a locking circuit for itself at armature 61, grounds the test wiper 65 at armature 60 as stated, opens the circuit for the rotary magnet 43 at armature 62, and at armature 59 and 63 completes the connection to the line wipers 64 and 66.

The desired connection has now been completed and the ring cut off relay 38 is immediately energized as follows: From either grounded generator and working contact of armature 81 and said armature, or booster battery and resting contact of armature 81 and said armature, resting contact of armature 53 and said armature, armature 63 and its working contact, line wiper 66, bank contact 69, conductor 79, winding of relay 76, conductor 80, bank contact 67, line wiper 64, working contact of armature 59 and said armature, armature 51 and its resting contact, and upper winding of ring cut off relay 38 to battery. Relay 38 at armature 52 locks itself to grounded release conductor 31, at the resting contacts of armatures 51 and 53 breaks the generator circuit, and at the working contacts of armatures 51 and 53 completes an energizing circuit for relays 76 and 34 as follows: From grounded release conductor 31, working contact of armature 52 and said armature, lower winding of relay 34 working contact of armature 53 and said armature, armature 63 and its working contact, wiper 66, bank contact 69, conductor 79, relay 76, conductor 80, bank contact 67, wiper 64, working contact of armature 59 and said armature, armature 51 and its working contact upper winding of relay 34 to battery. Relay 34, commonly known as the back bridge or reversing relay, reverses the line conductors 30 and 32 as regards their connection with the line relay 35. Relay 76, on energizing, short circuits itself at its armature 77 with the result that said relay is rapidly energized and deenergized. The relay 75, due to its high impedance and the rapidly opening and closing of its circuit at armature 78, is adjusted so as to deenergize and open its contacts when relay 76 is rapidly vibrating. When the relay 75 deenergizes the falling away of arma-

ture 73 removes battery from the clock magnet 71 which allows said magnet to deenergize. The magnet 71 is deenergized in this manner so that the continuously rotating chart will not be torn by the armature of said magnet after it has punched the chart. The difference in potential across the conductors 79 and 80 caused by the relay 76 rapidly energizing and deenergizing, is reproduced in the receiver of the watchman's station A by which the watchman is informed that his call has been registered.

After the watchman is assured that his call has been registered the receiver is replaced on the switch hook and the circuit for the line relay is opened thereat with the result that the line switch C and connector H are released. When the line relay 35 deenergizes, the release relay 36 in turn deenergizes, opens the holding circuit for the switching relay 14 of line switch C, and completes a circuit for the release magnet 44 through the off normal springs 70. The release magnet energizes and the connector H returns to its normal position.

The watchman repeats this operation, at all of the telephones in different parts of the factory that are assigned for his use, with the result that a complete record of his rounds and the time he made them is accurately recorded on the chart of the time clock.

It will be seen therefore, that I have provided a very simple, economical and highly efficient system of watchman's service, and one which is very flexible and also is very simply controlled from an existing telephone system. It will also be seen that false recording, caused by the using of one of the telephones assigned to the night watchman by some person working overtime, has been eliminated, since no record is made unless the particular code number 00 is called, and the watchman is the only person who knows of or has occasion to use this number.

Having fully described and ascertained the features and aspects of this invention, what I consider to be new and desire to have protected by Letters Patent will be pointed out in the appended claims.

What I claim is:

1. In a watchman's supervisory system, a recording device adapted to record the number of a calling telephone and the time at which the call is made, and means whereby the watchman making such a call is informed at the time said call is completed that it has been recorded.

2. In a watchman's supervisory system, a recording device adapted to record the number of a calling telephone and the time at which the call is made, and time controlled means common to a plurality of telephone lines whereby said recording device is made ineffective after a predetermined period.

3. In a watchman's supervisory system, a recording device adapted to record the number of a calling telephone and the time at which the call is made, means whereby the watchman making such a call is informed at the time said call is completed that it has been recorded, and time controlled means whereby said recording device is made ineffective after a predetermined period.

4. In combination with a telephone system having lines and automatic switches responsive to the dialing of a specified number to extend one of said lines to a specified connection, a recording clock mechanism common to only certain of said lines, a disc therefor graduated in hours and minutes and having a circular space thereon for each of said certain lines, said disc intersected by lines representing the time, a magnet for each circular space and a connection for the automatic switch individual to one of said certain lines whereby when said specified number is dialled from that line the magnet individual thereto is operated to mark said disc to indicate the line calling and the time of the call.

5. In combination with a telephone system having lines and automatic switches responsive to the dialing of a specified number to extend one of said lines to a specified connection, a recording clock mechanism common to only certain of said lines, a disc therefor graduated in hours and minutes and having a circular space thereon for each of said certain lines, said disc intersected by lines representing the time, a magnet for each circular space and a connection from the automatic switch individual to one of said certain lines whereby when said specified number is dialled from that line the magnet individual thereto is operated to mark said disc to indicate the line calling and the time of the call, and means whereby the person calling when said specified number is connected with is informed that said call has been recorded.

6. In combination with a telephone system having lines and automatic switches responsive to the dialing of a specified number to extend one of said lines to a specified connection, a recording clock mechanism common to only certain of said lines, a disc therefor graduated in hours and minutes and having a circular space thereon for each of said certain lines, said disc intersected by lines representing the time, a magnet for each circular space and a connection from the automatic switch individual to one of said cer-

tain lines whereby when said specified number is dialed from that line the magnet individual thereto is operated to mark said disc to indicate the line calling and the time of the call, and time controlled means whereby further recording of calls is made ineffective after a predetermined period.

7. In combination with a telephone system having lines and automatic switches responsive to the dialing of a specified number to extend one of said lines to a specified connection, a recording clock mechanism common to only certain of said lines, a disc therefor graduated in hours and minutes and having a circular space thereon for each of said certain lines, said disc intersected by lines representing the time, a magnet for each circular space and a connection from the automatic switch individual to one of said certain lines whereby when said specified number is dialled from that line the magnet individual thereto is operated to mark said disc to indicate the line calling and the time of the call, means whereby the person calling when said specified number is connected with is informed that said call has been recorded, and time controlled means whereby further recording of calls is made ineffective after a predetermined period.

8. In a watchman's supervisory system, a recording device adapted to record the number of any calling telephone in use by a watchman and the time at which the call is made, and means for giving the calling watchman an audible signal at the time the call is completed to inform him that the call has been recorded.

9. In a watchman's supervisory system, a recording device adapted to record the number of any calling telephone in use by a watchman and the time at which the call is made, and means for signalling the calling watchman over the calling telephone line at the time the call is made to inform him that the call has been recorded.

10. In a watchman's supervisory system, a recording device adapted to record the number of a calling telephone and the time at which the call is made, a normally energized relay for controlling said recording device, and means for controlling said relay to make said recording device ineffective after a predetermined period.

In witness whereof, I hereunto subscribe my name this 8th day of March, A. D. 1922.

DONALD R. MIDDLETON.