

947,320.

Fig. 1

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AUXILIARY SIGNALING APPARATUS FOR TELEPHONE-LINES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES S. WINSTON, a citizen of the United States of America, and resident of Chicago, county of Cook, and State of Illinois, have invented a new and useful Improvement in Auxiliary Signaling Apparatus for Telephone-Lines, of which the following is a specification.

My invention relates to fire alarm and watchmen's report signaling devices, and more particularly to means for operating such devices in connection with telephonic systems.

I propose to provide a simple mechanism or a plurality of such mechanisms, to be used in conjunction with the substation end of a telephone line, and adapted to send watchmen's signals and fire alarm signals to the central office. I also provide means at the central office for recording such signals, and I propose to associate such signal-sending and signal-receiving means with the telephonic system in such manner as to use the conductors of the telephonic system and the relays of such system which are ordinarily used for telephonic purposes for the operation of said signal-sending and signal-receiving devices, and thus produce an efficient and practical signaling system by merely adding to the ordinary telephonic installation said auxiliary signal-sending devices at the subscriber's station, and an auxiliary signal-receiving device at the central office.

I have illustrated in the accompanying drawing one form of the auxiliary attachments which I propose to associate with the telephonic circuit, and a sufficient part of a telephonic system to illustrate the way such attachments are adapted to be associated therewith and their operation in connection with such a system.

Figure 1 is a diagrammatic view of a telephone system showing only a part of the central office apparatus; Fig. 2 is a plan view of one form of the signal-sending device; Figs. 3 and 4 are detail views of the device of Fig. 2.

The telephonic system which I have partially illustrated consists of the telephone limbs 1 and 2 extending from the subscriber's station 3 to the central office. At the subscriber's station a transmitter 5 and receiver 6 are shown in a normally-open bridge of said line conductors, said bridge being

adapted to be closed at the switch hook 7 and contact point 8 when the receiver 6 is in use. At the central office one side of a cord circuit is represented by the tip strand 9 and sleeve strand 10, a central source of energy 11 being permanently bridged between said cord strands having one pole grounded at 12. The tip and sleeve contacts of the plug 13 are adapted to form connection with similar contacts of the jack 14, the sleeve contact of which is grounded at 15 through the winding of a cut-off relay 16. The armature 17 of said relay is normally connected with a grounded conductor 18, and the armature 19 of said relay is normally connected through the winding of the line relay 20 with one pole of the battery 11 by means of conductor 21. The armatures 17 and 19 are adapted when attracted by the cut-off relay 16 to sever their connection with the grounded conductor 18 and the winding of the line relay 20 and to connect the external limbs 1 and 2 of the telephone line with the tip and sleeve contacts, respectively, of the plug 14. A line signal 22 is adapted to respond to current from the battery 11 in the usual manner when the armature 23 of the line relay 20 is attracted, said lamp being energized over conductors 21 and 24.

The operation of the telephone system which I have described is as follows: When the subscriber removes his receiver from its hook a path for current is completed from central office battery 11 over conductor 21, line relay 20, armature 19 of cut-off relay 16, limb 2 of the telephone line through the substation apparatus, line conductor 1, armature 17 of the cut-off relay and conductor 18 to ground and back to the battery. Current flowing over this path energizes the line relay 20 which attracts its armature 23, thus lighting the line signal 22 in an obvious manner. Upon observing the signal the operator inserts the plug 13 into the jack 14 which closes a path for current from the battery 11 over the sleeve strand 10 of the cord circuit, sleeve of the jack 14, and the winding of the cut-off relay 16 to the ground 15. The energization of the cut-off relay severs the connection of the external limbs of the telephone line with the grounded conductor 18 and the line relay 20 and connects the same with the switchboard section of the line, thus permitting the current

through the cut-off relay above traced to divide at the armature 19, a portion of said current flowing over conductor 2 through the substation apparatus, over line conductor 5 1, through armature 17 of the cut-off relay, tip contacts of the jack 14 and plug 13 and over the tip strand of the cord circuit to the battery 11. Subscriber 3 is now in communication with the central office for conversation and a similar connection may be 10 made by means of the other half of the cord circuit with the subscriber desired, which has not been illustrated. It has also not been thought necessary to illustrate the supervisory signals by means of which the subscriber signals for a disconnection, as the 15 arrangement and operation of the same do not in any way affect the present invention. Upon receiving such a signal the operator will remove the plug 13 from the jack, thus 20 restoring all parts of the telephone system to normal condition. It will be understood that the above telephone system has been illustrated only for the purpose of explaining one method of associating my signal-sending and receiving apparatus with telephone systems generally, and that my invention is adapted for use with any other suitable telephonic system and is not intended to be limited to the circuit arrangement herein described. 30

In the present form of my invention I provide at the subscriber's station a small metal wheel 25 carried upon a suitable axle 35 26 and preferably insulated therefrom as shown in Fig. 3, adapted to be rotated by any suitable means as the crank 27. The axle 26 may be secured in position upon a suitable support by means of straps 28 and carries upon one end a disk 29 having a notch formed therein adapted to be engaged by a pawl finger 30 for holding the contact wheel 25 in normal position. The metal wheel 25 preferably has an extended portion 45 or hub 31 adapted to be engaged by the contact brush 32, a similar contact brush 33 being adapted to ride upon the periphery of said wheel. The contact wheel 25 carries a plurality of insulating segments 34 upon 50 one of which the brush 33 is adapted to normally rest, the pawl finger 30 holding said wheel in a proper position to be thus engaged by said brush. Any desirable number of said insulating segments 34 and alternating contact surfaces 35 may be provided upon said wheels, and any number of said wheels or signal-sending stations may be provided, as will be hereinafter explained. The specific construction of the contact 60 wheel 25 and the means for operating the same above described, are not essential to my invention and the same may be varied without departing from the spirit thereof.

At the central office a signal-receiving device 65 is provided which in the present in-

stance I have shown as a tape ticker 36, consisting preferably of a tape wheel 37 over which the strip of tape 38 is adapted to be fed by means of small feed wheels 39, said wheels being continuously driven at a pre- 70 arranged definite speed, in opposite directions by any suitable means, as clock works, as indicated by the arrows upon said wheels. A ticker or indicator 40 constitutes the armature of a magnet 50 and is adapted to be 75 brought into contact with the surface of the tape 38 to form a record thereon when said magnet is energized, in a manner well understood. An additional armature 51 is provided for the line relay 20, said armature 80 when attracted being adapted to close a path for current through the coils of the relay 50 by means of conductor 52.

As previously stated, any desired number of contact wheels 25 may be provided at 85 the subscriber's station and the same may be distributed or located in different parts of a building or other premises which the watchman is supposed to visit, and from which he is supposed to send in reports 90 at different times during the night. I have illustrated three of these devices, one being located at the substation instrument and the other two being located at a distance and bridge across the telephone line 95 by means of conductors 53 and 54. As shown when the instrument is in its normal condition, the contact brush 33 rests upon one of the insulating segments 34 carried upon the periphery of the wheel 25 and the 100 circuit of the line conductors remains open. Assuming that the crank 27 of the signal-sending device located at the substation instrument is given one complete revolution, the circuit of the line conductors will be 105 completed and broken three times, said wheel having three insulated segments disposed about its periphery. As the brush 33 traverses the contact surfaces 35 of said wheel a current will flow from the battery 110 11 through the coils of line relay 20 by means of conductor 21 over line conductor 2 through the brush 32, resting upon the hub 31 of the wheel 25, through contact brush 33 and back to the central station, 115 over line conductor 1 and to ground through conductor 18. It will thus be seen that the line relay 20 will be energized and de-energized three times in quick succession. The armature 23 will thus be attracted and 120 released three times, thus flashing the line signal 22 and indicating to the operator that the watchman has made a report from the station located at the subscriber's instrument. At the same time the armature 51 of 125 the line relay will be attracted and released three times, thus successively energizing and deenergizing the magnet 50 over conductor 52, thus attracting the armature 40 of the tape ticker and recording the report of the 130

watchman upon the traveling tape. It will thus be seen that a visual report will be sent to the central office, due to the flashing of the line lamp 22, and a permanent record will also be made of said report by the tape ticker 36. The reports of the watchman or fire alarm signals sent to the office by means of the signal-sending devices or wheels 25 can be readily distinguished by the operator from calls for a connection for conversation, by means of the rapidity with which the line signal will be lighted and distinguished. Should the other signal-sending devices shown in connection with the substation 3 be operated, four impulses and five impulses, respectively, would be sent over the line to the central office, thus making a different record upon the signal-receiving device 36, and indicating which instrument has been operated.

It will also be noted that my device will also record the calls received from the substation for conversation, and the duration of such conversation, as the signal-receiving device 36 would be operated in the same manner when the receiver is removed from the switch hook 7 as when the wheels 25 are rotated, excepting that a continuous record would be made upon the tape 38, that is, the armature 40 would be continuously held in engagement with the tape 38 from the time the receiver was removed until the operator answered the call. I thus provide a watchman's fire alarm and report service

to be used in connection with telephone systems which utilizes the line conductors, the line relay and signal and the battery of said systems. A complete service of the class described is thus produced by installing a small and inexpensive auxiliary attachment or signal-sending device at the telephone substation and a simple and inexpensive auxiliary signal-receiving device at the central office. It will also be noted that my invention gives a visual and a permanent record of such reports or alarms and the time of receiving the same, due to the time-driven tape mechanism 36, and also records the calls received from the telephone instrument.

I claim:

The combination with a telephone line normally open at the substation, of a line relay at the central office, a line signal circuit completed by the actuation of the line relay, and a recording device for permanently recording specific signals having its circuit completed in parallel with the line signal and adapted to be actuated whenever the circuit is closed between the limbs of the telephone line at the substation, substantially as described.

Signed by me at Chicago, county of Cook, and State of Illinois, in the presence of two witnesses.

CHARLES S. WINSTON.

Witnesses:

C. B. CAMP,
E. F. GRIER.