(No Model.)

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SIGNAL ATTACHMENT FOR TELEPHONES.

No. 454,504. Patented June 23, 1891.

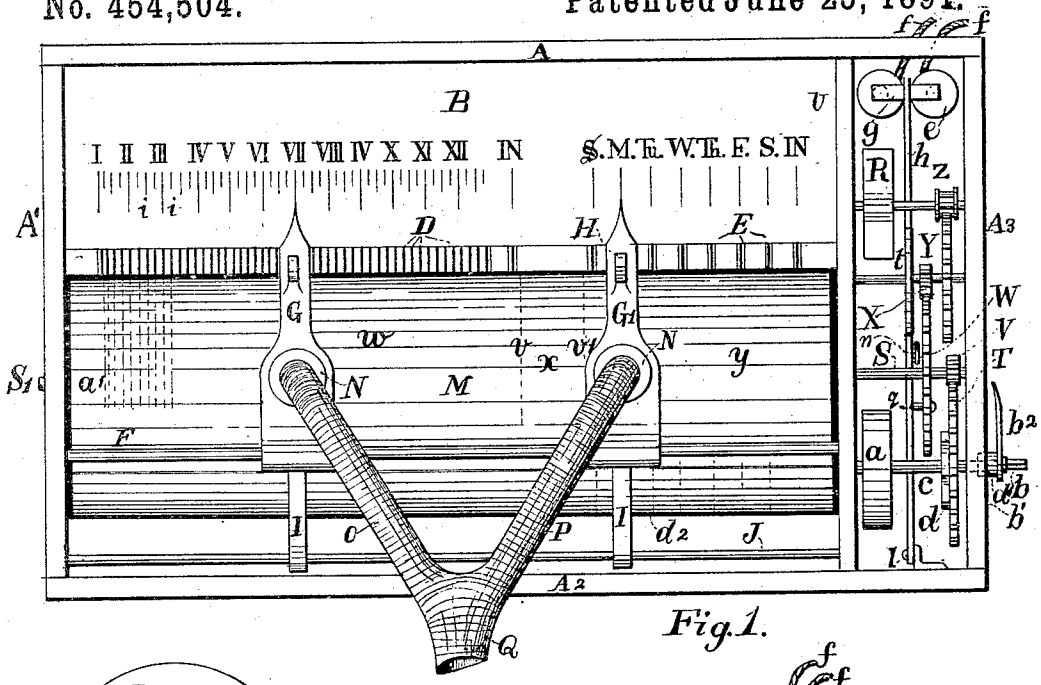

Fig. 1.

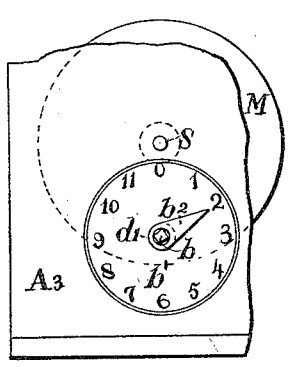

Fig. 3.

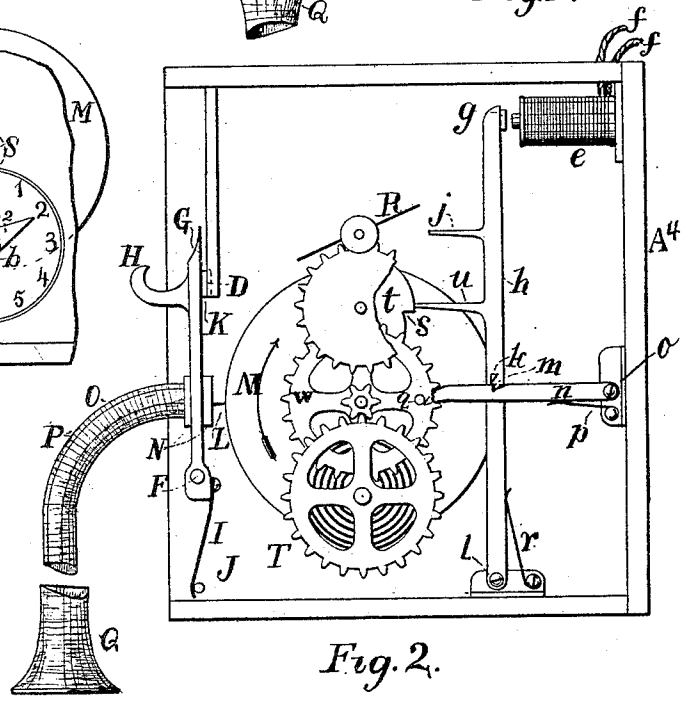

Fig. 2.

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SIGNAL ATTACHMENT FOR TELEPHONES.

SPECIFICATION forming part of Letters Patent No. 454,504, dated June 23, 1891.

Application filed June 23, 1890. Serial No. 356,370. (No model.)

To all whom it may concern:

Be it known that we, ALFRED D. SUNDEEN, SWAN B. MOLANDER, and GUSTAF W. ANDERSON, residing at Mora, in the county of Kanabec, State of Minnesota, and ANDREW M. CARLSEN, of St. Paul, Ramsey county, State of Minnesota, citizens of the United States, have invented certain new and useful Improvements in Signal Attachments for Telephones; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Our invention relates to attachments for telephones, and has for its objects to enable the telephone in the absence of an operator or attendant to return to parties ringing up the telephone a verbal answer stating at what time the absent operator will return, and to give any other information that the operator wishes to give through the telephone during his absence.

A further object of our invention is to produce a telephone-signal that will automatically send a verbal signal or information through the telephone when the latter is rung up, and also to serve as a visible signal for parties calling in person.

A still further object is to enable the telephone to make a record of the number of times it has been rung up during the absence of the operator.

We attain these objects by the combination, with the telephone, of a phonograph through a mechanism of such construction that the ringing up of the telephone starts the phonograph, and a winding-spring operates and automatically stops it. The said mechanism consists, mainly, of a train of gear-wheels operated by a winding-spring and operating a signal-roller, a rotary fan for regulating the speed of the instrument, and levers actuated by springs and by an electro-magnet connected in the circuit of the telephone, and as the said mechanism has been fully shown, described, and claimed in our other application for improvements in telephone-signals, bearing even date herewith, we refer to the said application for a more minute description and for the claims covering points herein shown but not claimed.

In the accompanying drawings, Figure 1 is a front elevation of our signal device, shown without any cover or door. Fig. 2 is an end elevation of Fig. 1, with the end wall A^3, the dial *b*, dial-finger *b'*, and the partition-strip U removed. Fig. 3 is a detail view of the call-recorder.

Similar letters refer to similar parts throughout the several views.

The back A^4, the four walls A, A', A^2, and A^3, and the partition U constitute the frame and case of the instrument.

B is a strip secured to the walls A A' and to the partition U. This strip B is provided near its lower edge with notches D, corresponding in number with the numerals from 1 to 12, and the marks *i i*, and the word "In," arranged as shown upon the strip, for the purpose of indicating the twelve hours and the fourths of the hours of the clock. The said strip B is further provided with the initials of the days of the week and with the word "In," and has notches E, corresponding in number with the number of the days in the week and the word "In" after the seven days.

Upon the bar F, which is secured by its ends in the wall A' and the partition U, is movably fitted the pointers G and G', which are of so similar construction that the one of them shown in Fig. 2 represents in that view either of them. Each of the said pointers G and G' has a horn or projection H for taking hold of in moving the pointers along upon the bar F to set them upon the day and time of the day desired, thereby pointing out the time that the person setting the instrument will return to his office, or upon the word "In" for indicating that he is present in his office. Each of the said hooks G and G' is further provided at its lower end with spring I, that bears with its lower end against the outer side of the bar J, upon which it slides sidewise when the pointers are moved upon the bar F. Said springs I force the knife-

shaped lips K of the pointers G and G′ into the notches D and E, thereby adjusting the pointers more easily to their exact places, which is very important, as the pointers G and G′ are provided with phonographic needle-points L, which play over different vertically-arranged lines of speech previously produced upon the surface of the revoluble roller M in the ordinary way that phonographic rollers are prepared for reproducing speech. The needle-points L are secured to a vibrating plate located inside of the tube N, all of usual and well-known construction in phonographs. Each of said vibrating plates, when vibrated by the revoluble roller M, will pronounce through the bifurcated flexible tube O P Q any word previously produced upon the roller M and with which the needle-point is set in contact, and by placing the funnel-shaped part Q of the flexible tube O P Q over the transmitter of the telephone the words reproduced by the roller will be heard through the telephone-line in the same manner that natural speech is heard through it. The roller M is secured upon a shaft S, which is journaled in the walls A′ and A^3, and also has a bearing in the partition U. The pinion V, the wheel W, the pinion X, the wheel Y, the pinion Z, and the fan R are all rigidly secured upon their respective shafts, which are journaled in the wall A^3 and the partition U. The said train of gear-wheels is operated by the mainspring *a*, which is wound up by an ordinary clock-key or crank placed upon the winding-stem *b*, formed at the end of the main shaft *c*. The ratchet-pawl and ratchet-wheel *d* connect the mainspring *a* and the shaft *c* with the wheel T. The fan R regulates the speed of the gear-wheels. The electro-magnet *e* is connected by its wires *f f* in the circuit of the telephone, so that when the telephone is rung up the electric current passes around the magnet *e* and magnetizes it. This causes the magnet to attract the anchor *g* of the lever *h*, so that its arm *j* releases the fan R and permits the mainspring *a* to revolve the gear-wheels and the roller M, which is secured thereto. The arrangement of the instrument is such that whenever the telephone starts it the roller M will make just one revolution and then stop automatically until the telephone is rung up again, as will be seen by the following description. The lever *h*, when attracted by the magnet *e*, swings on its pivot *l* till its pin *k* engages with the notch *m* in the lever *n*, which is pivoted at *o*, and is constantly forced upward toward the pin *k* by the spring *p*. When the ringing of the telephone ceases, the electric current is broken and the magnet ceases to hold the lever *h* away from the fan R, and the spring *r* will drive the arm *j* of the lever *h* into a stopping-contact with the fan R. To prevent the latter from taking place before the roller M has made one revolution and to secure just one revolution of it, we depend on the engagement of the pin *k* with the notch *m* for retaining the lever *h* near the magnet until the pin *q*, secured in the wheel W, engages with the free end of the lever *n* and swings the notch *m* away from the pin *k*. This done, the lever *h* is so far at liberty to swing back and engage with the fan R; but as this would stop the instrument with the end of the lever *n* bearing against the pin *q*, instead of against the pin *k*, ready to engage with the latter as soon as the lever *h* is swung toward the magnet by the ringing of the telephone, we let the circular edge of the disk or cam *t* resist the arm *u* until the pin *q* has passed the free end of the lever *n*, when the notch *s* of the cam *t* receives the end of the arm *u*, and thus the arm *j* can reach the fan R and stop every part of the instrument in the proper position. The arm *u*, when resting at the edge of the cam *t*, is short enough to permit the lever *h* to lean so far away from the magnet that the notch *m* cannot re-engage with the pin *k* when the lever *n* swings up against it from its engagement with the pin *q*, as already described.

The surface of the roller M may be considered as divided by the vertical lines *v* and *v′* into three portions *w*, *x*, and *y*. Upon the portion *w* we produce on one side of the roller parallel vertically-arranged lines of words, as indicated by the dotted lines *a′*. The one of those lines that is nearest to the end of the roller contains the words "One o'clock" or "Out till one o'clock." The next line will say "A quarter past one." The third line will say "Half-past one." The fourth line will say "A quarter to two," and the next succeeding line will say "Two o'clock," and so on with all the hours and quarters of the hours shown by the clock. Between each of said lines of words we arrange, where so desired, smaller fractions of the hours than fourths of an hour.

Upon the portion *y* of the roller we produce on the opposite side from that containing the time of the clock seven lines d^2, each of which contains, respectively, the words "Sunday," "Monday," "Tuesday," and so on, all the days in the week. The portion *x* of the roller, which may be much larger than shown in the drawings, is reserved for special messages, of which some may be permanently fixed upon the roller, the same as the days of the week and the time of day, and some may be produced from time to time, according to the wants of the party using the telephone.

Either one of the two pointers G and G′ may be set so as to register with and pronounce the special message to the transmitter of the telephone, the same as the lines *a′* pronounce the hours and the lines d^2 the days of the week to the telephone.

The call-register or call-indicator consists in the present case of a dial *b′*, painted or affixed upon the wall A^3 of the case, as shown in Fig. 1, and still clearer in Fig. 3. The shaft *c* projects out through a hole in the center of

the said dial b' and carries a dial-finger b^2, which has a friction-sleeve d', that holds the dial-finger in its place upon the shaft c by frictional contact, thus permitting of the setting of the dial-finger by turning it upon the shaft. The dial b' is provided with numerals and marks so arranged with reference to the gearing that when the roller M makes one revolution the dial-finger moves to the next higher number or mark upon the dial until it reaches the highest number, when its next move will be to 0, 1, 2, &c. The number of signal-marks upon the dial will be smaller or larger, according to the proportion between the wheel T and the pinion V. The present dial is divided for a wheel being twelve times larger than the pinion.

When the operator is in his office some time during each day in the week he keeps the pointer G' set at the word "In" succeeding the abbreviations of the days in the week, and if he is in his office all day he keeps the pointer G set at the word "In" succeeding the hours of the day as arranged upon the strip B.

When the signal device is not needed for some time, we use a common switch (not shown) for turning the electric current off from the magnet e.

In setting the pointers G and G' the needle-points L are kept from dragging on the roller M by swinging the pointers away from the roller, so as to clear the ridges between the notches D and E.

From the above description it will be seen that we produce a signal-instrument that may be set so as to automatically send off through the telephone most any message that is desired to send to those calling up the telephone during the absence of its operator, and that our instrument also registers the number of calls made at the telephone, and that by mutual agreement between users of telephones the number of times the telephone is rung up may constitute a signal showing the importance of the call that has been made at the telephone. It is further evident that our signal device is very handy and complete as a visible and legible signal for parties calling in person.

We do not wish to confine ourselves to the exact construction shown in the present illustration of our invention, as it is evident that the principle of our invention may be carried out through various styles of mechanisms.

Having thus described our invention, what we claim, and wish to secure by Letters Patent, is—

1. The combination, with a telephone, of a phonograph and an electro-magnet connected in the circuit of the telephone for releasing the phonograph by passing an electric current over the line from other stations, means for conducting the sound of the predetermined speech from the phonograph to the transmitter of the telephone to which the phonograph is attached, and means for stopping the phonographs after it has given the distant station the predetermined information, substantially as described.

2. The combination, with a telephone, of the signal device having a phonographic roller with predetermined speech produced upon it and a train of gear-wheels actuated by a winding-spring for revolving said roller, an electro-magnet for releasing said train of wheels, the spring-actuated levers h and n, the lever n having the notch m, the notched cam t, the fan R, and the pins k and q for stopping the roller M after each full revolution of it, a vibrating plate vibrated by the roller, and a tube for conducting the sound-waves from the vibrating or sounding plate to the transmitter of the telephone, substantially as and for the purpose described.

3. In a signal-instrument for telephones, the combination of a spring-operated phonograph having a fan for controlling its speed with the stopping and starting mechanism, consisting of the electro-magnet e, the lever h, having the arms j and u, the anchor g, the pins k and q, the spring r, the spring-actuated lever n, having the notch m, and the cam t, having the notch s, substantially as and for the purpose set forth.

4. In a signal-instrument, the combination of the visible signal device, consisting of the strip B, having the time of the clock and the days of the week marked in straight lines upon it, the bar F, the pointers G and G', sliding upon said bar and having projections engaging with notches in the strip or board B, and springs for holding the pointers in engagement with said notches, with the audible signal device, consisting of a spring-actuated phonograph having a rotary fan for controlling its speed and an electro-magnet for releasing the phonograph by electricity, said audible signal device having also a bifurcated tube for conducting the sound of the phonograph either direct or indirect, through the instrumentality of a telephone, to the ear of the party releasing or starting the instrument, substantially as shown and described.

5. The return-signal device consisting of a board or table having the time of the clock and the days of the week marked in straight lines upon it, and two pointers sliding upon a bar fixed parallel to the line or lines containing the time of the clock and days of the week, said board having notches into which projections of the pointers are held by springs, said pointers having thumb-pieces for taking hold of in moving them along on the bar, substantially as shown, and for the purpose set forth.

6. In a signal-instrument for telephones, the combination of the phonographic roller M and the vibrating plates having the needle-points L with the pointers G and G', the notches D, the strip B, having the hours and fractions of the hours and the days of the week marked upon it, and the bifurcated flexible tube O P Q for conducting the sound of the

words reproduced to the transmitter of the telephone, substantially as and for the purpose specified.

7. In a signal attachment for telephones, the combination of the herein-described call-registering device with the herein-described phonographic return-signal device operated by a winding-spring regulated by a fan and started by an electro-magnet connected in the circuit of the telephone, substantially as shown and described.

In testimony whereof we affix our signatures in presence of two witnesses.

ALFRED D. SUNDEEN.
SWAN B. MOLANDER.
GUSTAF W. ANDERSON.
ANDREW M. CARLSEN.

Witnesses:
J. C. POPE,
R. W. SAFFORD.