

S. W. GRAY.
APPOINTMENT SIGNAL FOR TELEPHONES.

No. 470,786.

Patented Mar. 15, 1892.

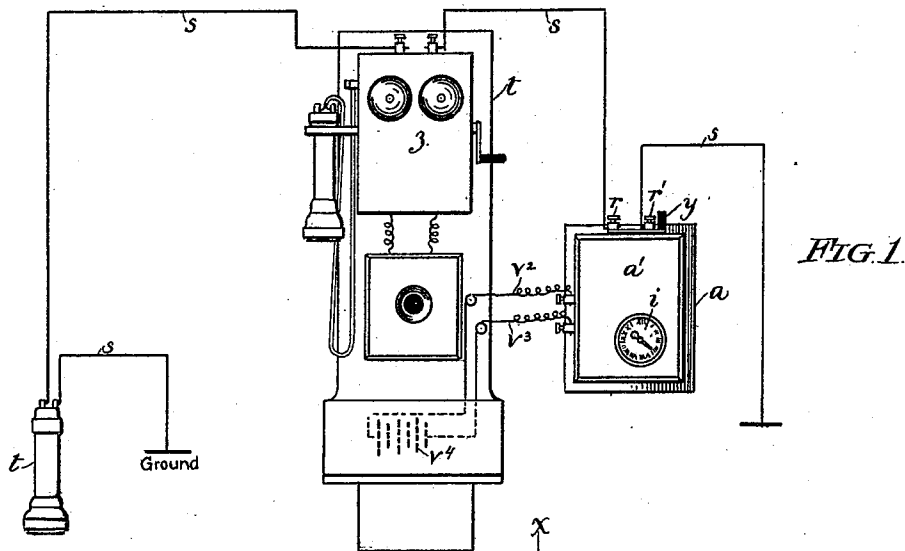


FIG. 1.

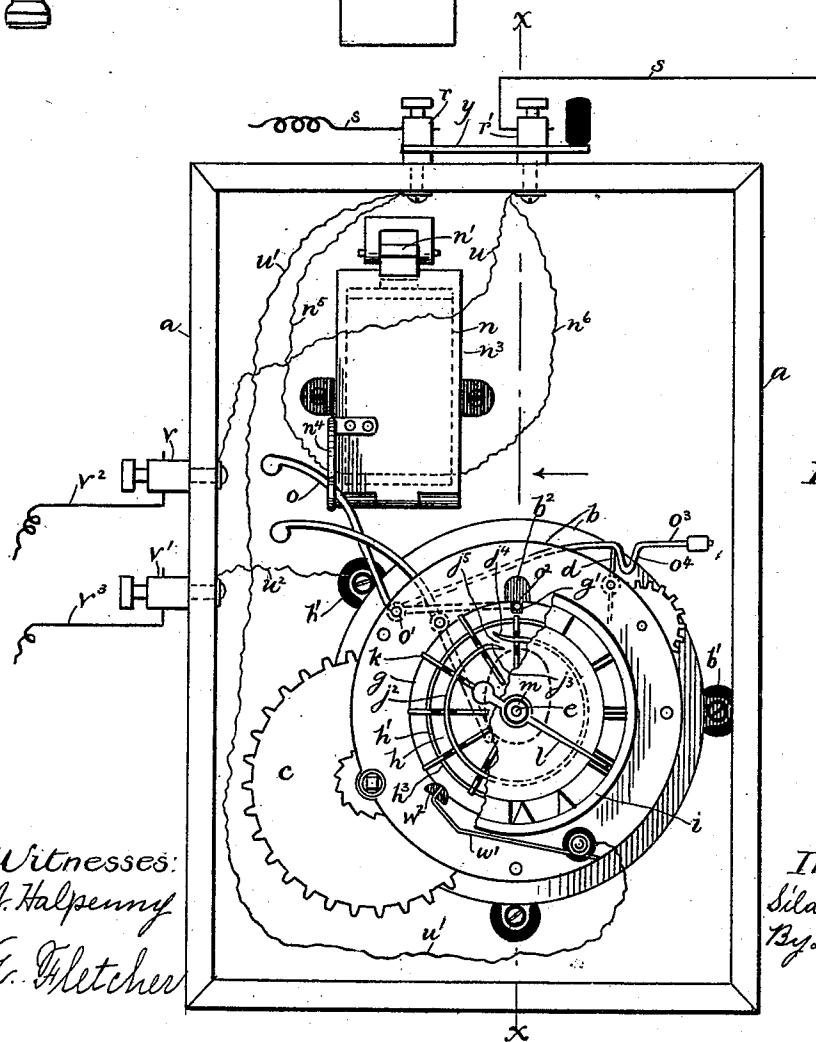


FIG. 2.

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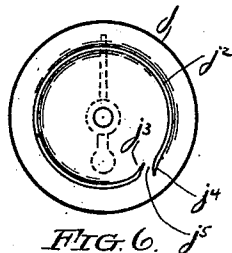
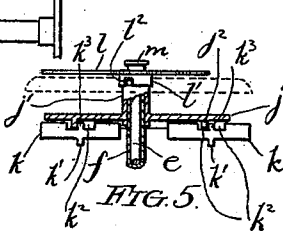
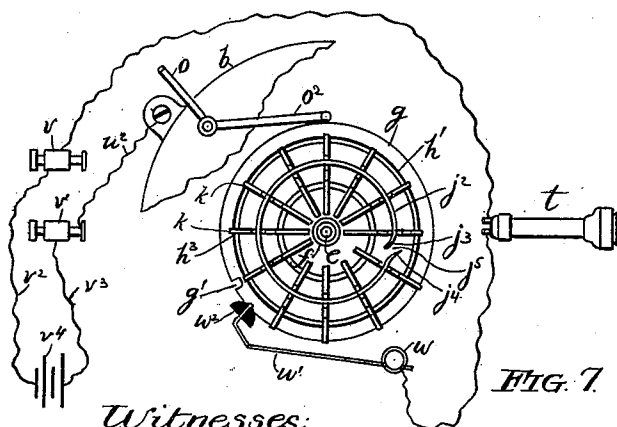
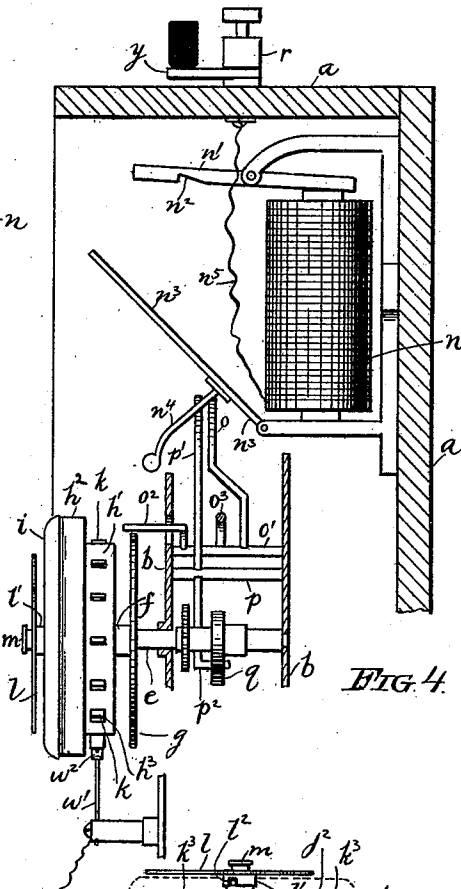
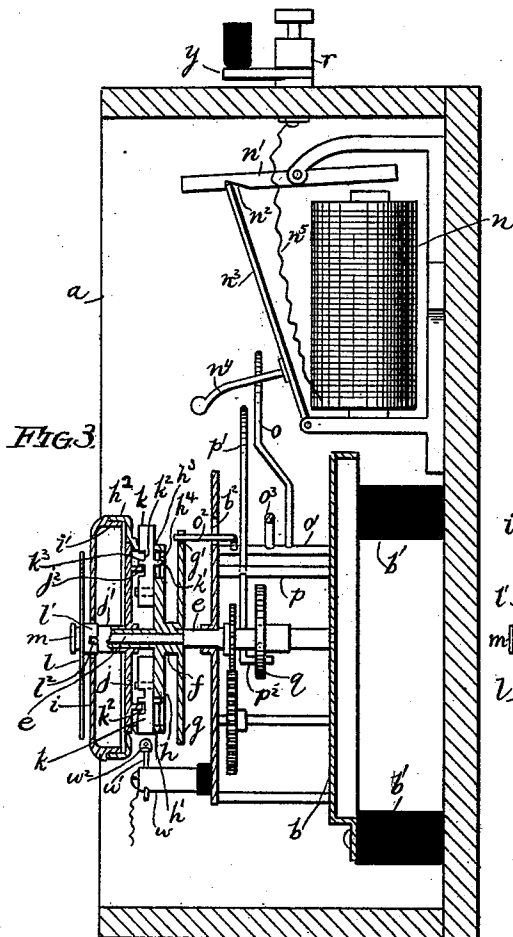
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UNITED STATES PATENT OFFICE.

SILAS W. GRAY, OF FORT DODGE, IOWA.

APPOINTMENT-SIGNAL FOR TELEPHONES.

SPECIFICATION forming part of Letters Patent No. 470,786, dated March 15, 1892.

Application filed May 12, 1891. Serial No. 392,426. (No model.)

To all whom it may concern:

Be it known that I, SILAS W. GRAY, of Fort Dodge, in the county of Webster and State of Iowa, have invented certain new and useful

Improvements in Appointment-Signals for Telephones, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in which—
Figure 1 is a diagram view showing a telephone and its electrical connections combined with my improved signal. Fig. 2 is a front elevation of my improved device, the cover being removed to show the interior, and a portion of the dial being broken away to display the working parts. Fig. 3 is vertical sectional view of my improved signal, taken upon the line *xx*, Fig. 2, viewed in the direction of the arrow there shown, the respective parts being represented in their normal positions. Fig. 4 is a like view, partly broken away, showing some of the parts in reversed positions. Fig. 5 is a detail view, partly in section, illustrating the construction of the circuit making and breaking device. Fig. 6 is a rear view of the revoluble circular guide for actuating the contact-points; and Fig. 7 is a face view in detail of the several contact-points and the disk upon which they are placed, including a diagram of the electrical connections.

Corresponding letters of reference in the different figures indicate like parts.

The object of my invention is to so construct an appointment-signal for telephones that in case of the absence of a party called at a given station the time of his return may be indicated by means of a suitable signal in the receiver at the transmitting-station without the use of an additional bell or other special signaling device, but merely by placing the signal mechanism in circuit with said receiver and a source of electricity.

A further object is to so construct said device that the movement of its mechanism may be induced or initiated by the act of ringing the magneto call-bell by the one making the call.

To these ends my invention consists in the combination of elements hereinafter more particularly described, and definitely pointed out in the claims.

Referring to the drawings, *a* indicates the case of my improved device, which is substantially like that of an ordinary clock, having a door *a'*, Fig. 1.

Within the case *a* is mounted a frame *b*, which, if the case be made of metal, is insulated therefrom by means of suitable studs *b'* of a non-conducting material. The frame *b* serves as a support for a train of gears, as clearly indicated in Figs. 2, 3, and 4, the same or substantially the same as that employed in an ordinary clock, being driven by a spur-gear *c*, Fig. 2, actuated by means of a spring or otherwise, and having at the end thereof a fan or fly-wheel *d*, as shown in said last-named figure.

Keyed or splined to a projecting arbor *e*, which conforms to the hour-hand arbor of a clock, is a sleeve *f*, attached to or integral with which is a disk *g*, a circular plate *h*, having an annular flange *h'*, from which is extended a secondary enlarged flange *h²*, Figs. 3 and 4, into which is fitted an annular flange *i'* of a dial-plate *i*, numbered like a clock-face. A sleeve *j'*, having a disk *j* rigidly attached thereto or integral therewith, is loosely mounted upon the sleeve *f*, the disk *j* resting against or fitting into the flange *h'*, thereby forming a chamber between the plates *h* and *j*, for the purpose hereinafter stated. Upon the inner face of the plate *h* and near the outer edge is formed a circular groove *h⁴*, Fig. 3, while a series of radial grooves corresponding in number to the figures on the clock-dial are also formed in said plate, said grooves terminating in slots *h³*, Figs. 2, 4, and 7, formed in the flange *h'*. Within said radial grooves are loosely placed a series of metal pieces *k*, intended to serve as electric contact-points, for the purpose hereinafter specified, the longitudinal movement of said pieces being limited by means of pins *k'*, Figs. 3 and 5, which protrude from said pieces and rest in the groove *h⁴*, which forms a stop to limit the longitudinal movement of the parts *k* by engagement with the studs *k'*. Upon the opposite side of the pieces *k* are formed notches *k²*, between which are left pins *k³*. A circular guide-flange *j²* is adjusted to rest normally in one or the other of the notches *k²*, said flange being provided with lips *j³* *j⁴*, curved in opposite directions from each other, so as to form a space *j⁵* be-

tween them sufficiently wide to receive the pins k^3 .

Upon the sleeve j' is loosely mounted a secondary sleeve l' , Figs 3 and 4, to which is rigidly attached a hand l . In the sleeve l' is formed a notch l^2 , which is engaged by a pin upon the sleeve j' , thereby enabling the disk j to be revolved in unison with said hand. The respective sleeves are secured in position upon the arbor by means of a nut m .

Located within the case a is an electro-magnet n , above which is pivoted a gravity-armature n' , having a notch n^2 therein adapted to engage a drop n^3 , pivoted at the bottom to the magnet-support. Said drop is provided with an extended arm n^4 , projecting outwardly therefrom, which is adapted to fall upon a lever o , pivoted to a rock-shaft o' in the frame b and having a laterally-bent arm o^2 at the opposite end, which is extended through a slot in the front plate of the frame b and is free to fall into a notch g' in the disk g . A third arm o^3 , Figs. 2, 3, and 4, is extended from the rock-shaft o' , and is provided with a detent o^4 , Fig. 2, adapted to normally engage and arrest the movement of the fly-wheel d , and with it the entire train. A secondary rock-shaft is pivoted in the frame, from which is extended an arm p , in operative proximity to the arm n^4 , while a secondary arm p^2 , having a lateral bend at the lower end, is rigidly attached to said rock-shaft and adjusted to engage with a cam q upon the arbor e . (Indicated in dotted lines in Fig. 2 and shown in Figs. 3 and 4.) Said arms and cam are so adjusted that before the notch g' reaches its normal position, as a result of the revolution of the cam q , the arm p' will have served to lift the drop n^3 into engagement with the notch n^2 and permit the parts to fall back to the position shown in Fig. 2. The end wires n^5 n^6 of the magnet n are secured, respectively, to binding-posts r r' , which are in turn connected with the line-wire s , connecting in the usual way with telephones t , only one of which is shown, at the respective stations. In Fig. 1 a receiver t' , in lieu of an entire telephone, is shown as interposed in said line at the distant station, for purposes of illustration.

Connecting with the binding-posts r r' are wires u u' , one of which u leads to a binding-post v upon the case a and the other to a binding-post w , attached to but insulated, as shown, from the metal frame b . A third wire u^2 connects the metal frame b with a binding-post v' . Wires v^2 v^3 lead from the binding-posts v v' to the battery v^4 of the telephone. (See Figs. 1 and 7.)

Extending from the binding-post w is a weak spring-wire w' , the end of which is bent, as shown in Figs. 2 and 7, into close proximity to the sliding contact-points k , but normally out of engagement therewith. Upon the end of said spring is a shoe w^2 of vulcanite or other non-conducting material, through which said wire slightly projects. This en-

ables the pieces k , when fully projected, to readily pass and make a metallic contact with said spring w' without obstruction.

Attached to one of the binding-posts r r' is a switch y , which is intended normally to connect said binding-posts. When said switch is open, the magneto-bell z , Fig. 1, of the telephone is brought into circuit with the electro-magnet n .

Having thus described the various parts of my invention, I will now describe its operation. Assuming that a party at a given station is desirous of leaving his office to return at four o'clock, he opens the switch y and places the hand l opposite to the figure "4," as shown in Fig. 2. A party at a distant station desirous of calling him rings the magneto-bell z , Fig. 1, when the magnet n is excited and attracts the armature n' , thereby releasing the drop n^3 . The arm n^4 , falling upon the arm o , tilts the rock-shaft and lifts the end of the arm o^2 out of the notch g' , also raising the arm o^3 , releasing the fly-wheel held thereby, and permitting the train of wheels, and with them the arbor e , to revolve, together with the case of which the plate h forms a part. As the hand l is set normally at twelve and all of the pins k^3 of the sliding contact-points k are then within the circular guide j^2 , the movement of said hand to the fourth figure, carrying with it the plate j , while the plate h remains stationary, being held by the stoppage of the train, serves to throw the pins k^3 of four of said contact-points outside of the circle of said guide, thereby protruding said points k , as shown in said Fig. 4. The train being released, as stated, the plates g and h are revolved with the arbor and the protruding points k are thus brought one by one into contact with the end of the spring w , thereby producing a series of clicking sounds in the receiver of the telephone at the distant station, the number of sounds thus produced corresponding to that at which the hand l is placed in the station called and indicating to the one making the call the hour at which the absent party is expected to return. It is obvious that the end of the wire w' may be notched or corrugated, so as to enable the sounds to be varied in different instruments, thereby enabling them to be distinguished in case a number are placed in a common circuit.

The advantages of my improved device are obvious, as the user of a telephone is thereby wholly relieved from the annoyance of repeatedly calling a given number, when, by the use of my invention, he might know at once at what time to expect a reply. A further advantage thereof is that instead of employing a bell or gong to make the signal, thereby causing confusion, a distinct and unmistakable sound is given in the receiver of the telephone itself without change or modifying its construction.

Having thus described my invention, I claim—

1. The combination, with the main line of a telephone, of a series of radially-movable contact-points, a dial and clock-train, a stationary contact-point, said radially-movable contact-points being mounted in a revoluble frame and arranged to bear a fixed relation to the figures on the clock-dial, means for protruding said points consecutively into a path in operative proximity to said stationary point, an electro-magnet abnormally in circuit with said telephone-line, an armature and releasing device in operative proximity to said magnet, and means for re-engaging said releasing device and returning it to its normal position upon a single revolution of the disk bearing said radial contact-points, substantially as described.

2. In a signaling device of the class described, the combination, with a stationary contact-point, of a series of radially-movable contact-points, a dial and hand, the circular guide j^2 , the opening j^5 of which is arranged to bear a fixed relation to the hand and the figures upon the dial, means for revolving said adjustable contact-points, and means for placing them, together with said stationary contact-point, in circuit with the main line of a telephone.

3. The combination, with the hand l , of the plate j , circular guide-flange j^2 , having bent lips $j^3 j^4$, bent in opposite directions, and the movable contact-points k , provided with pins

l^3 , adapted to engage with said flange, substantially as shown and described.

4. The combination, with the driving-train and its coacting parts, of an electro-magnet in abnormal circuit with the main line of a telephone, a gravity-armature, drop n^3 , having an arm n^4 projecting therefrom, arms $o o^2 o^3$, mounted upon a rock-shaft with the notched disk g , and fly-wheel d , whereby the excitement of said magnet may serve to release said train and arrest its movement upon the completion of one revolution of the disk g , substantially as shown and described.

5. The combination, with the electro-magnet n , abnormally in circuit with the main line of a telephone, of a signaling device, as specified, clock mechanism for operating the same, a drop normally held by said magnet, train-releasing mechanism arranged to be actuated by said drop, the lever p' , in operative proximity to said drop, and a revoluble cam, whereby the revolution of said cam, when the train is released, may serve to return said drop to its normal position, substantially as specified.

In testimony whereof I have signed this specification, in the presence of two subscribing witnesses, this 6th day of May, A. D. 1891.

SILAS W. GRAY.

Witnesses:

D. H. FLETCHER,
J. H. PURDY.