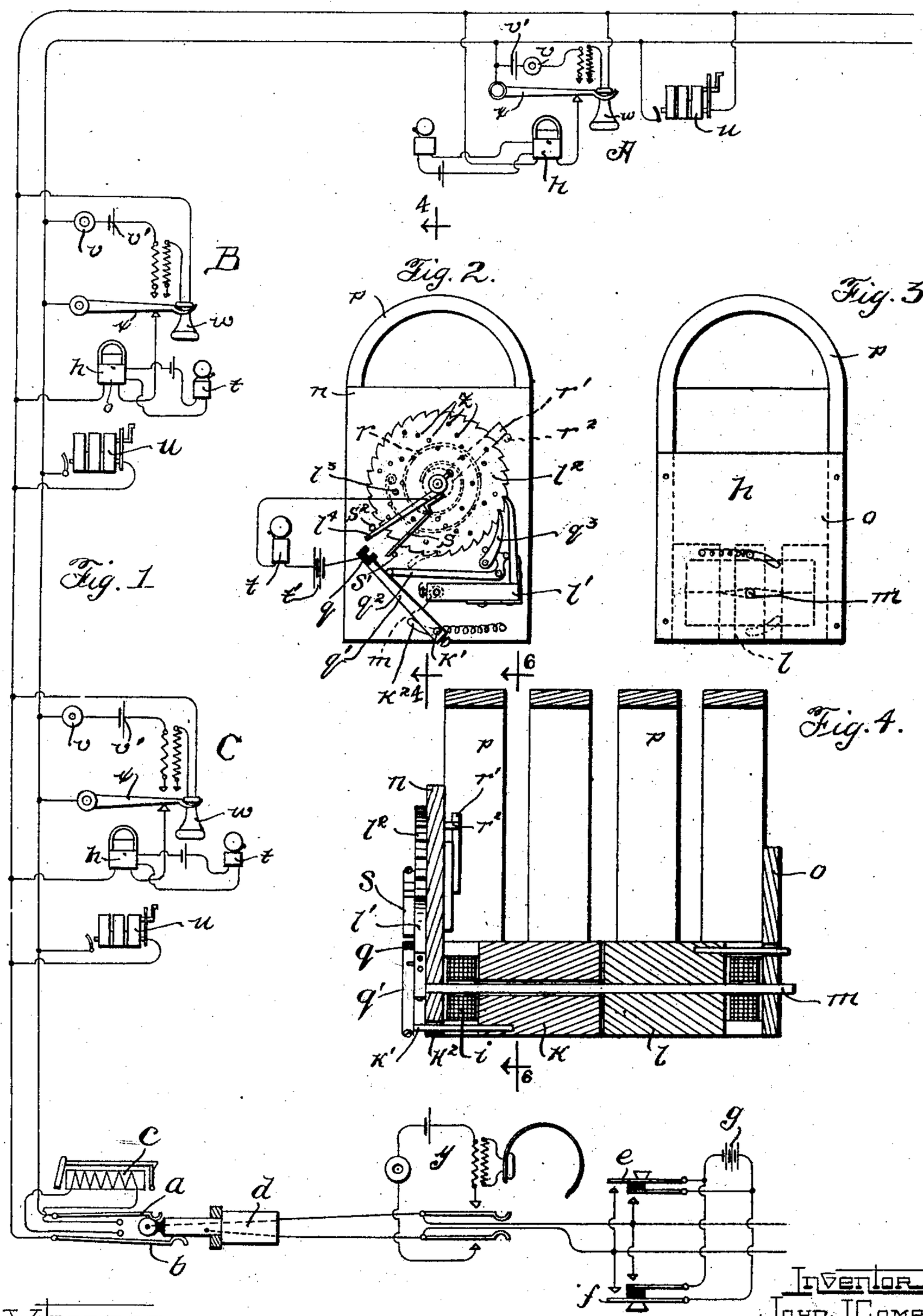
No. 765,413. PATENTED JULY 19, 1904.

J. J. COMER.

SELECTIVE SIGNALING APPARATUS.

APPLICATION FILED MAY 22, 1901.

NO MODEL. 2 SHEETS—SHEET 1.



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 5

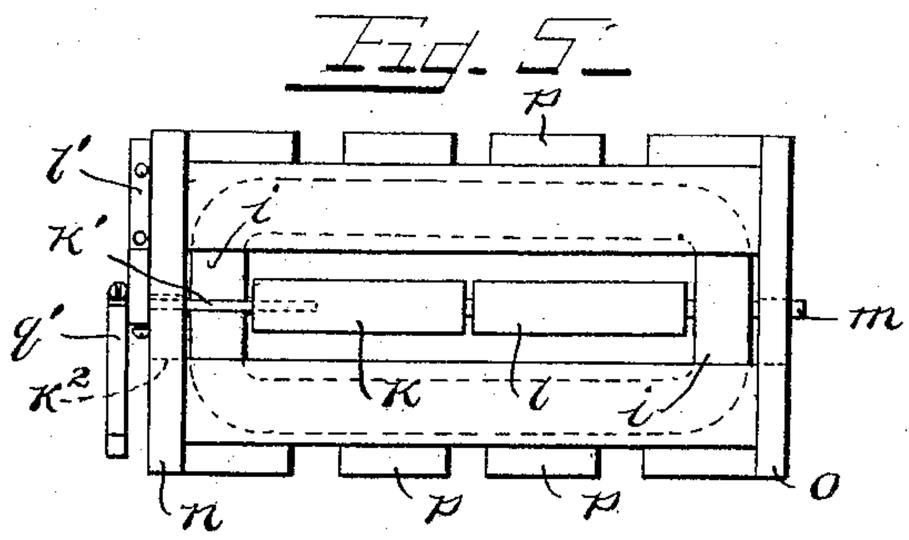
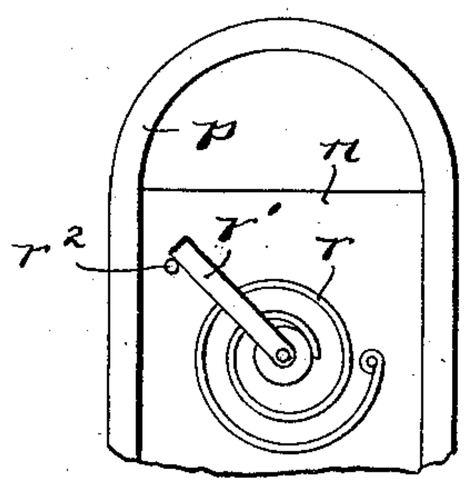


Fig. 6



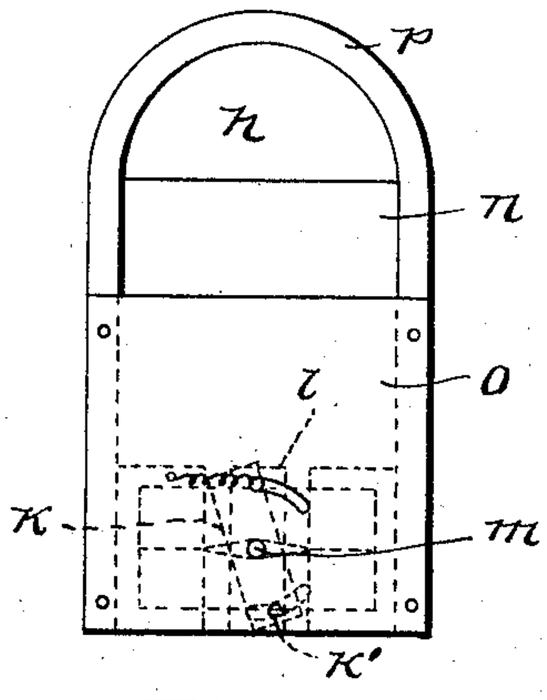


Fig. 7

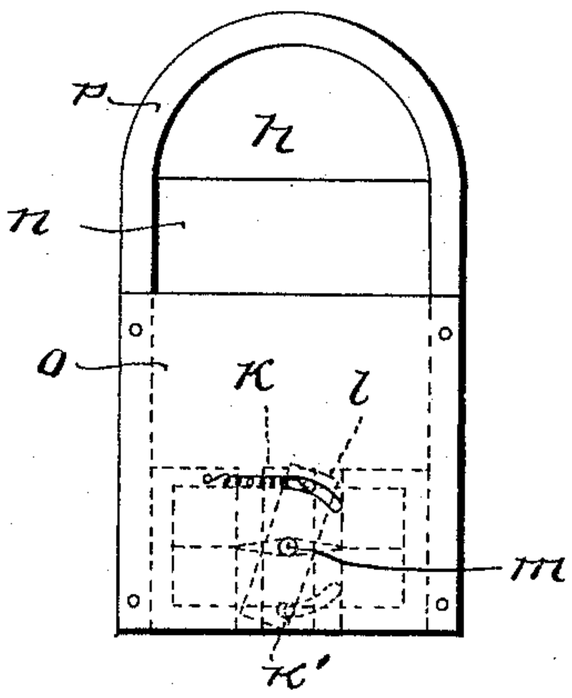


Fig. 8

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No. 765,413. Patented July 19, 1904.

UNITED STATES PATENT OFFICE.

JOHN J. COMER, OF PARKRIDGE, ILLINOIS.

SELECTIVE SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 765,413, dated July 19, 1904.

Application filed May 22, 1901. Serial No. 61,369. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. COMER, a citizen of the United States, residing at Parkridge, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Selective Signaling Apparatus, (Case No. 1,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to signaling apparatus designed particularly for use in connection with telephone-exchange systems, and has for its object the provision of improved means whereby substations of a party telephone-line may be selected and signaled without unintentionally operating the signaling apparatus at other stations.

In practicing my invention I employ a signal-controlling apparatus designed to be located at each subscriber's station of a party telephone-line, the signal-controlling apparatus comprising a setting device for adjusting the position of one signaling circuit-contact terminal and an actuating device for engaging the remaining signaling-terminal with the aforesaid terminal when the aforesaid terminal has been brought into position by the setting device. When two contacts are thus placed in juxtaposition and engaged with each other, a circuit including the selected subscriber's signal is closed. The signal may be of any suitable form. I prefer to employ local batteries at the substations as the sources of current for operating the signals, in circuit with which are included single-stroke bells. I do not wish to be limited,, however, to the precise character of the current employed for operating the signals nor to the character of the signals.

In practicing the invention I employ a single motor means at each subscriber's station, which is adapted to effect the actuation of the signaling-terminals. The motor means preferably employs a single stationary energizing-winding, within whose field is located an armature composed of relatively movable sections, one of which sections is limited to a rotation in a clockwise direction, while the other is limited to a rotation in a contra-clockwise direction. The armature is preferably composed of soft iron, whereby it may be readily magnetized by the said winding, and is also arranged within the field of a magnet that is preferably permanent.

There is employed in the preferred embodiment of the invention pole-changing switching apparatus at the exchange, whereby current may be directed through the winding of each motor mechanism in opposite directions. When the current is directed through the winding in one direction, the soft-iron armature is polarized thereby, and in coöperation with the permanent magnet a rotative tendency is effected, tending to cause the rotation of the armature-sections both in one direction. One of the armature-sections, however, is provided with restraining means, so that its companion alone will be rotated. The first armature-section that is caused to rotate or move is preferably that which sets the adjustable or traveling signaling-terminal, which is preferably movable with relation to and about the axis of a ratchet-wheel, the wheel being rotated a step each time the actuating armature-section is operated. When this adjustable terminal at the selected station is properly placed, the current through the winding of the motor is preferably reversed, so that the polarity of the soft-iron armature is reversed, tending to cause a rotation of the armature in the opposite direction; but means are provided whereby that armature-section which was the first to move is now prevented from moving, its companion then being actuated to swing or move the companion signaling-terminal into engagement with the previously-adjusted signaling-terminal to effect a signal at the selected subscriber's station. By this same act the actuating-pawl and locking-dog coöperating with the ratchet-wheel are disengaged therefrom, permitting the ratchet-wheel at each party-line station to be restored to its normal position. The terminals of the selected signal when engaged are through a suitable agency prevented from disengagement during the continuance of current through the winding of the motor.

I will explain my invention more fully by reference to the accompanying drawings, in which—

Figure 1 illustrates a party telephone-line and so much of a telephone-exchange apparatus as is necessary to coöperate with the signaling apparatus at the substations of the party-line. Fig. 2 is an end elevation of a motor such as may be employed at each station. Fig. 3 is a view of the other end of the motor. Fig. 4 is a sectional view on line 4 4 of Fig. 2. Fig. 5 is a bottom view of my improved device. Fig. 6 is a partial sectional view on line 6 6 of Fig. 4. Fig. 7 is an end view showing one armature in its actuated position, the contact-actuating mechanism being omitted for the sake of clearness. Fig. 8 is a view similarly showing the other armature in its actuated position.

Like parts are indicated by similar characters of reference throughout the different views.

In the drawings I have illustrated a party telephone-line in this instance extending from three substations A B C, though by means of my invention the number of substations upon each party-line need not be limited. The party telephone-line terminates at the exchange in a spring-jack having line-springs *a b*, provided with back contacts, with which a line-signal *c* is connected. A connecting-plug *d*, constituting the connecting end of a cord-circuit, is inserted within the jack. The party telephone-line being metallic, the cord-circuit is provided with two strands, with which are associated calling-keys *e* and *f*, the key *e* serving to include the signaling-battery *g*, which may be from one hundred to one hundred and fifty volts, in circuit with the party-line in one direction, or the key *f* may serve to reverse the polarity of this battery. At each station is located a signal-controlling motor *h*, provided with a stationary winding *i*, wound in horizontal convolutions and inclosing an armature formed in sections *k l*. A shaft *m* is provided to afford a rotatable mounting for the armature-sections, this shaft being fixed with relation to the section *l*, while the section *k* is movable with relation to the shaft. The shaft is mounted in journal-bearings in the end plates *n* and *o*, that are secured to permanent magnets *p p*. When the winding *i* is not in circuit, the armature may occupy an intermediate position, as it is not polarized. If the key *e*, for example, is the setting-key, when the same is closed current will be passed through the windings *i* of the motors *h*, polarizing the armature *k l* of each motor in a direction to effect a contra-clockwise rotation, as viewed in Fig. 2, of the setting-armature section *l* to effect a corresponding rotation of the shaft *m*, which carries the actuating-pawl *l'*. The companion armature-section *k* is prevented from rotating in the same direction as the armature-section *l* by means of a pin *k'* engaging a slot k^2. The pawl *l'* engages the ratchet-wheel l^2. It will be evident that, depending upon the direction of current in the winding *i*, the two armatures *k* and *l* will have a tendency to rotate in one direction or another. The armature-sections are not polarized and by means of the springs employed, as shown, will occupy vertical positions. The armature *k* is loose upon the shaft *m*, as has been stated, and whatever movement of the armature *k* is occasioned due to the winding *i* said movement does not affect the rotation of the shaft *m*, whereas a movement of the armature *l*, which is fixedly secured to the shaft *m*, occasions a rotation of said shaft. The movement of the armature *k*, however, effects the closure of an electric circuit, as hereinafter set forth, due to the pin *k'*, connected therewith. The armatures are provided with pins, respectively mounted at the end portions thereof, which pins are adapted to permit of rotation of said armatures in one direction only. The pin *k'*, fastened to the armature *k*, slides in a slot k^2, so that by reference to Fig. 2 it will be seen that said armature *k* can only move in a clockwise direction, due to the influence of the coil *i*, and when said influence is stopped then the spring connected with said pin *k'* will draw the armature *k* back into its vertical position. The pin, in association with the armature *l*, is also adapted to move in a slot, but permits of a movement of said armature *l* in a contra-clockwise direction, a spring again being employed to draw the armature back into the vertical position when the turning effort in a contra-clockwise direction ceases. It will now be apparent that if current of a given direction is impressed on the circuit including the coil *i* both armatures will tend to move in the same direction; but as the movement of one armature only is permitted in a clockwise direction, whereas the other can move only in a contra-clockwise direction, only one armature will move due to the influence of the coil *i*. If now current of opposite polarity is sent through the coil *i*, the second armature will be moved and the first remains stationary.

Referring more particularly to Figs. 7 and 8, in Fig 7 I have shown the armature *k* in an operated condition—that is, in a position of largest displacement, due to the influence of the coil *i*—and in Fig. 8 I have shown the armature *l* in a position of largest displacement, due to the influence of the coil *i*, the displacement of the armature *l* being in an opposite direction to the displacement of the armature *k* under the influence of the coil *i* when currents of opposite directions pass therethrough.

This ratchet-wheel is provided with a single switch-actuating pin l^3, designed to be brought into engagement with a movable terminal l^4 through the agency of the actuating-pawl *l'*. When the ratchet-wheel has been actuated to bring the pin l^3 into engagement with the

switch-arm l^4, it preferably only requires another single actuation to bring this arm l^4 into alinement with the circuit-terminal q. When the terminal l^4 has been thus brought into alinement with the terminal q by the successive actuation of the ringing-key e and the corresponding successive oscillations of the armature-section l, the key f is next depressed to reverse the current through the winding i, and thereby cause an actuation of the armature-section k.

An arm q' is secured to the pin k', so that when this pin is moved within its slot upon the rotation of the armature-section k the terminal q is brought into contact with the terminal l^4. When the arm q' is thus actuated, a releasing-lever, preferably in the form of a bell-crank q^2, is actuated to release the locking-dog q^3 from the ratchet-wheel l^2 and at the same time to maintain the pawl l' out of engagement with the ratchet-wheel, whereupon the spring r is permitted to restore the ratchet-wheel to its initial position. The ratchet-wheels at all of the stations are thus restored to their initial positions, each preferably being provided with a lug r', carried thereby and engaging a contact-post r^2 on the frame of the machine. When the ratchet-wheels are in their initial positions, the pins l^3 of the different motors are unequal distances from the contact-arms l^4, their spacings apart corresponding to the distances between the teeth of the ratchet-wheels. Thus it is obvious that although all the ratchet-wheels upon the line are operated each time the key e is actuated but one pin l^3 operates to aline the contacts l^4 and q at the selected station. Upon the release of the key f, that has been depressed long enough to convey the required signal, the armature-section k is restored, the arm q' falling away from the contact-terminal l^4, whereupon the spring s, carried by the arm l^4, engaging a stop s' on the frame of the motor, forces the said contact-arm against its back-stop s^2. Thus preferably, although the ratchet-wheels at the various substations may rotate through various angles, according to the number of actuations of the key e, the arm l^4 at the selected station is unmoved until the post l^3 comes in contact therewith, after which a single step movement of the ratchet-wheel will move the arm l^4 into alinement with the terminal q. It will be seen that when selecting a station of a higher number the arm l^4 of all stations of a lower number which are passed do not stop in a position to be engaged by contact q on a reversal of current, but pass beyond one cog or division in the direction of rotation to a safe position where contact cannot be made. In this safe position the arms l^4 strike the stops s' and are thus prevented from further rotation. This results in preventing the further rotation of the ratchet-wheels l^2 on account of the small amount of power supplied by the energization of the coil i. For convenience of construction the arm l^4 is loosely mounted upon the shaft to which the ratchet-wheel l^2 is secured. The terminals l^4 and q at each station constitute terminals of a conductor thereat in which the signaling device t is included. In this instance the signaling source of current is in the form of a battery t', located at each substation, though I do not wish to be limited to the character of the source of current nor its location. When a battery is employed, the signal-bell t is preferably a single-stroke bell.

I have not shown a common battery system, the invention in this instance being illustrated as applied to a party telephone-line employing open-circuit ringing-generators u u, which when operated are bridged across the line to effect an actuation of the drop c. These ringing-generators do not impress current upon the line that will effect actuation of the pawls l'.

At each substation is also illustrated a telephone-transmitter v, connected in a local circuit with a transmitter-battery v' and a receiver w. At each station is illustrated also a gravity switch-hook x for controlling the continuity of the conductors, including the transmitter and receiver. At each exchange there is diagrammatically indicated also an operator's telephone set y.

The ratchet-wheel is provided with a number of holes z, in one only of which is disposed a pin l^3. The distances between the holes correspond to the distances between the teeth of the ratchet-wheel. Thus the apparatus for all of the party-telephone-line stations may be made standard, it only being necessary to adjust the positions of the pins l^3, which obviously are all located at unequal distances from the contact-arms l^4, so that but one station may be selected and signaled at a single time.

It is obvious that many changes may be made from embodiments of my invention herein shown and particularly described, and I do not, therefore, wish to be limited to the precise disclosure herein set forth; but,

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a selective signaling apparatus, the combination with a ratchet-wheel mounted on a shaft, of electromagnetic means for operating said wheel, an actuating-pin extending from said ratchet-wheel, a contact-arm rotatably mounted upon said shaft to be engaged by said pin after the ratchet-wheel has been operated a predetermined number of times and to be moved by said pin from a normal to an alternative position, a second contact-arm with which the aforesaid contact-arm is brought into line when thus actuated, electromagnetic mechanism for effecting the actuation of said second contact-arm to make contact with the aforesaid arm, a signaling-circuit

of which said contact-arms are terminals, and a signaling device and a source of current included in the said circuit at the same signaling-station with the ratchet-wheel, substantially as described.

2. In a selective signaling apparatus, the combination with a ratchet-wheel mounted on a shaft, of electromagnetic means for operating said wheel, an actuating-pin extending from said ratchet-wheel, a contact-arm rotatably mounted upon said shaft to be engaged by said pin after the ratchet-wheel has been operated a predetermined number of times and to be moved by said pin from a normal to an alternative position, a second contact-arm with which the aforesaid contact-arm is brought into line when thus actuated, electromagnetic mechanism for effecting the actuation of said second contact-arm to make contact with the aforesaid arm, a signaling-circuit of which said contact-arms are terminals, a signaling device and a source of current included in the said circuit at the same signaling-station with the ratchet-wheel, mechanism for releasing the ratchet-wheel upon engagement of said contacts, a spring for restoring the ratchet-wheel when thus released, and a spring for restoring the first of the aforesaid contact-arms when the said contact-arms are disengaged, substantially as described.

3. In a selective signaling apparatus, the combination with a ratchet-wheel, of a contact with respect to which the ratchet-wheel is movable, a second contact with which the aforesaid contact is brought into line by the ratchet-wheel after it is actuated a predetermined number of times, an armature divided into two sections, mechanism for limiting the armature-sections to rotation in opposite directions and preventing their rotation in the same direction, a winding for energizing the armature-sections, a body of magnetic material influencing the rotation of the armature upon the presence of current in the said winding, a switching device in circuit with the winding, one of the said contacts being actuated by one of the armature-sections and the other contact by the other armature-section, a signaling-circuit of which the said contacts are terminals, and a signaling device included in the said circuit and located at the same signaling-station with the contacts and the armature-sections actuating the same, substantially as described.

4. In a selective signaling apparatus, the combination with a ratchet-wheel, of a contact with respect to which the ratchet-wheel is movable, a second contact with which the aforesaid contact is brought into line by the ratchet-wheel after it is actuated a predetermined number of times, an armature divided into two sections, mechanism for limiting the armature-sections to rotation in opposite directions and preventing their rotation in the same direction, a winding for energizing the armature-sections, a field-magnet presenting poles of unchangeable sign, a source of current, a pole-changing switch for directing current through the said winding in one direction or the other to exert torque upon the armature in one direction or the other, a signaling-circuit of which the said contacts are terminals, and a signaling device included in the said circuit and located at the same signaling-station with the contacts and the armature-sections actuating the same, substantially as described.

5. In a selective signaling apparatus, the combination with a ratchet-wheel, of a contact to be engaged thereby after the ratchet-wheel has been operated a predetermined number of times to be thereby moved from its normal to an alternative position, a second contact with which the aforesaid contact is brought into line when thus actuated, electromagnetic mechanism for effecting the operation of both of the said contacts, a signaling-circuit of which the said contacts are terminals, a signaling device included in the said circuit at the same signaling-station with the ratchet-wheel and the mechanism and contacts aforesaid, mechanism for releasing the ratchet-wheel upon the engagement of the said contacts, a spring for restoring the ratchet-wheel when thus released, and a spring for restoring the first of the aforesaid contacts when the said contacts are disengaged, substantially as described.

6. In a selective signaling apparatus, the combination with a ratchet-wheel, of a contact with respect to which the ratchet-wheel is movable, a second contact with which the aforesaid contact is brought into line by the ratchet-wheel after it is actuated a predetermined number of times, electromagnetic mechanism for effecting the operation of both of the said contacts, a signaling-circuit of which the said contacts are terminals, a signaling device included in the said circuit at the same signaling-station with the ratchet-wheel and the mechanism and contacts aforesaid, mechanism for releasing the ratchet-wheel upon the engagement of the said contacts and operated by the last contact to be actuated, a spring for restoring the ratchet-wheel when thus released, and a spring for restoring the first of the aforesaid contacts when the said contacts are disengaged, substantially as described.

7. In a selective signaling apparatus, the combination with a ratchet-wheel, of a contact with respect to which the ratchet-wheel is movable, a second contact with which the aforesaid contact is brought into line by the ratchet-wheel after it is actuated a predetermined number of times, an armature divided into two sections, mechanism for limiting the armature-sections to rotation in opposite directions and preventing their rotation in the same direction, a winding for energizing the

armature-sections, a body of magnetic material influencing the rotation of the armature upon the presence of current in the said winding, a switching device in circuit with the winding, one of the said contacts being actuated by one of the armature-sections and the other contact by the other armature-section, a signaling-circuit of which the said contacts are terminals, a signaling device included in the said circuit and located at the same signaling-station with the contacts and the armature-sections actuating the same, mechanism for releasing the ratchet-wheel upon the engagement of the said contacts and operated by the last contact to be actuated, a spring for restoring the ratchet-wheel when thus released, and a spring for restoring the first of the aforesaid contacts when the said contacts are disengaged, substantially as described.

8. In a selective signaling apparatus, the combination with a ratchet-wheel, of a contact with respect to which the ratchet-wheel is movable, a second contact with which the aforesaid contact is brought into line by the ratchet-wheel after it is actuated a predetermined number of times, an armature divided into two sections, mechanism for limiting the armature-sections to rotation in opposite directions and prevent their rotation in the same direction, a winding for energizing the armature-sections, a field-magnet presenting poles of unchangeable sign, a source of current, a pole-changing switch for directing current through said winding in one direction or the other to exert torque upon the armature in one direction or the other, a signaling-circuit of which the said contacts are terminals, a signaling device included in the said circuit and located at the same signaling-station with the contacts and the armature-sections actuating the same, mechanism for releasing the ratchet-wheel upon the engagement of the said contacts and operated by the last contact to be actuated, a spring for restoring the ratchet-wheel when thus released, and a spring for restoring the first of the aforesaid contacts when the said contacts are disengaged, substantially as described.

9. In a selective signaling apparatus, the combination with a contact, of a step-by-step adjusting device for moving the said contact from a normal to an alternative position, a second contact, an electromagnetic device having two physically-distinct armatures constrained to move in opposite directions about an axis passing longitudinally through both armatures, one of said armatures serving to actuate said step-by-step device, the remaining armature serving to bring said contacts into electrical engagement, means for impressing currents of opposite polarity upon said electromagnetic device, thereby to selectively actuate one or the other of said armatures, a circuit having these contacts as terminals, and a signal included in the circuit located at the same signaling-station with the contacts and devices actuating the same, substantially as described.

10. In a selective signaling apparatus, the combination with a contact, of a step-by-step adjusting device for moving the said contact from a normal to an alternative position, a second contact, an electromagnetic device having a single actuating-winding and having two physically-distinct armatures constrained to move in opposite directions about an axis passing longitudinally through both armatures, one of said armatures serving to actuate said step-by-step device, the remaining armature serving to bring said contacts into electrical engagement, means for impressing currents of opposite polarity upon said electromagnetic device, thereby to selectively actuate one or the other of said armatures, a circuit having these contacts as terminals, and a signal included in the circuit located at the same signaling-station with the contacts and devices actuating the same, substantially as described.

11. In a selective signaling apparatus, the combination with a ratchet-wheel mounted upon a shaft, of an actuating-pin extending from said wheel, a contact-arm rotatably mounted upon said shaft to be engaged by said pin after the ratchet-wheel has been operated a predetermined number of times and to be moved by said pin from a normal to an alternative position, a second contact-arm with which the aforesaid contact-arm is brought into line when thus actuated, an armature divided into two sections, mechanism for limiting the armature-sections to rotation in opposite directions and preventing their rotation in the same direction, a winding for polarizing the armature-sections, a body of magnetic material influencing the rotation of the armature upon the presence of current in the said winding, a switching device in circuit with the winding, pawl mechanism operated by one armature to actuate said ratchet-wheel, the other contact-arm being actuated by the other armature-section to engage the arm moved by said pin, a signaling-circuit of which the said contact-arms are terminals, and a signaling device and a source of current included in said circuit and located at the same signaling-station with the contact-arms and the armature-sections actuating the same, substantially as described.

12. In a selective signaling apparatus, the combination with a ratchet-wheel mounted upon a shaft, of an actuating-pin extending from said wheel, a contact-arm rotatably mounted upon said shaft to be engaged by said pin after the ratchet-wheel has been operated a predetermined number of times and to be moved by said pin from a normal to an alternative position, a second contact-arm with which the aforesaid contact-arm is brought into line when thus actuated, an armature di-

vided into two sections, mechanism for limiting the armature-sections to rotation in opposite directions and preventing their rotation in the same direction, a winding for polarizing the armature-sections, a body of magnetic material influencing the rotation of the armature upon the presence of current in the said winding, a switching device in circuit with the winding, pawl mechanism operated by one armature to actuate said ratchet-wheel, the other contact-arm being actuated by the other armature-section to engage the arm moved by said pin, a signaling-circuit of which the said contact-arms are terminals, a signaling device and a source of current included in said circuit and located at the same signaling-station with the contact-arms and the armature-sections actuating the same, mechanism for releasing the ratchet-wheel upon the engagement of the said contact-arms, a spring for restoring the ratchet-wheel when thus released, and a spring for restoring the first of the aforesaid contact-arms when the said contact-arms are disengaged, substantially as described.

13. In a selective signaling apparatus, the combination with a ratchet-wheel mounted upon a shaft, of an actuating-pin extending from said wheel, a contact-arm rotatably mounted upon said shaft to be engaged by said pin after the ratchet-wheel has been operated a predetermined number of times and to be moved by said pin from a normal to an alternative position, a second contact-arm with which the aforesaid contact-arm is brought into line when thus actuated, an armature divided into two sections, mechanism for limiting the armature-sections to rotation in opposite directions and preventing their rotation in the same direction, a winding for polarizing the armature-sections, a body of magnetic material influencing the rotation of the armature upon the presence of current in the said winding, a switching device in circuit with the winding, pawl mechanism operated by one armature to actuate said ratchet-wheel, the other arm being actuated by the other armature-section to engage the arm moved by said pin, a signaling-circuit of which the said contact-arms are terminals, a signaling device and a source of current included in said circuit and located at the same signaling-station with the contact-arms and the armature-sections actuating the same, mechanism associated with said second contact-arm for disengaging the pawl mechanism to release said ratchet-wheel upon actuation of said second contact-arm, a spring for restoring the ratchet-wheel when thus released, and a spring for restoring the first of the aforesaid contact-arms when the said contact-arms are disengaged, substantially as described.

14. In a selective signaling device, the combination with a ratchet-wheel, of a contact-arm with respect to which the ratchet-wheel is movable, a second contact-arm with which the aforesaid contact-arm is brought into line by the ratchet-wheel after it is actuated a predetermined number of times, pawl mechanism for actuating said ratchet-wheel, electromagnet mechanism for operating said pawl mechanism, electromagnet mechanism for operating said second contact-arm, a signaling-circuit of which the said contact-arms are terminals, a signaling device and a source of current included in the said circuit at the same station with the ratchet-wheel and the mechanism and contact-arms aforesaid, and mechanism associated with said second contact-arm for disengaging the pawl mechanism to release said ratchet-wheel upon actuation of said second contact-arm, substantially as described.

15. In a selective signaling apparatus, the combination with a ratchet-wheel, of a contact-arm with respect to which the ratchet-wheel is movable, a second contact-arm with which the aforesaid contact-arm is brought into line by the ratchet-wheel after it is actuated a predetermined number of times, pawl mechanism for actuating said ratchet-wheel, electromagnet mechanism for operating said pawl mechanism, electromagnet mechanism for operating said second contact-arm, a signaling-circuit of which the said contact-arms are terminals, a signaling device and a source of current included in the said circuit at the same station with the ratchet-wheel and the mechanism and contact-arms aforesaid, mechanism associated with said second contact-arm for disengaging the pawl mechanism to release said ratchet-wheel upon actuation of said second contact-arm, a spring for restoring the ratchet-wheel when thus released, and a spring for restoring the first of the aforesaid contact-arms when the same contact-arms are disengaged, substantially as described.

In witness whereof I hereunto subscribe my name this 14th day of May, A. D. 1901.

JOHN J. COMER.

Witnesses:

GEORGE L. CRAGG,

HERBERT F. OBERGFELL.