D. W. KNEISLY.

LOCK-OUT DEVICE FOR PARTY TELEPHONES.

APPLICATION FILED APR. 27, 1908.

953,340.

Patented Mar. 29, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

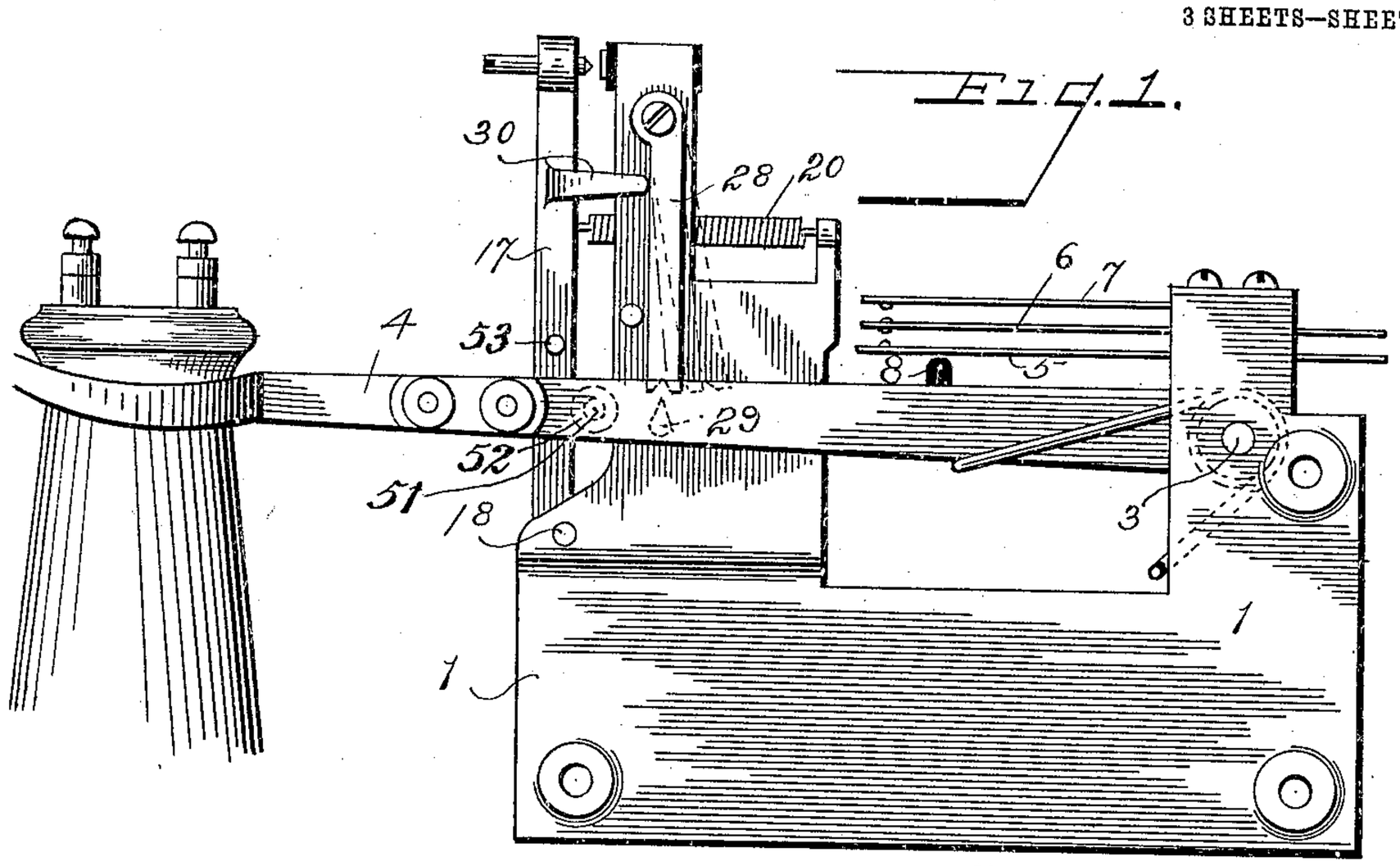

Fig. 2.

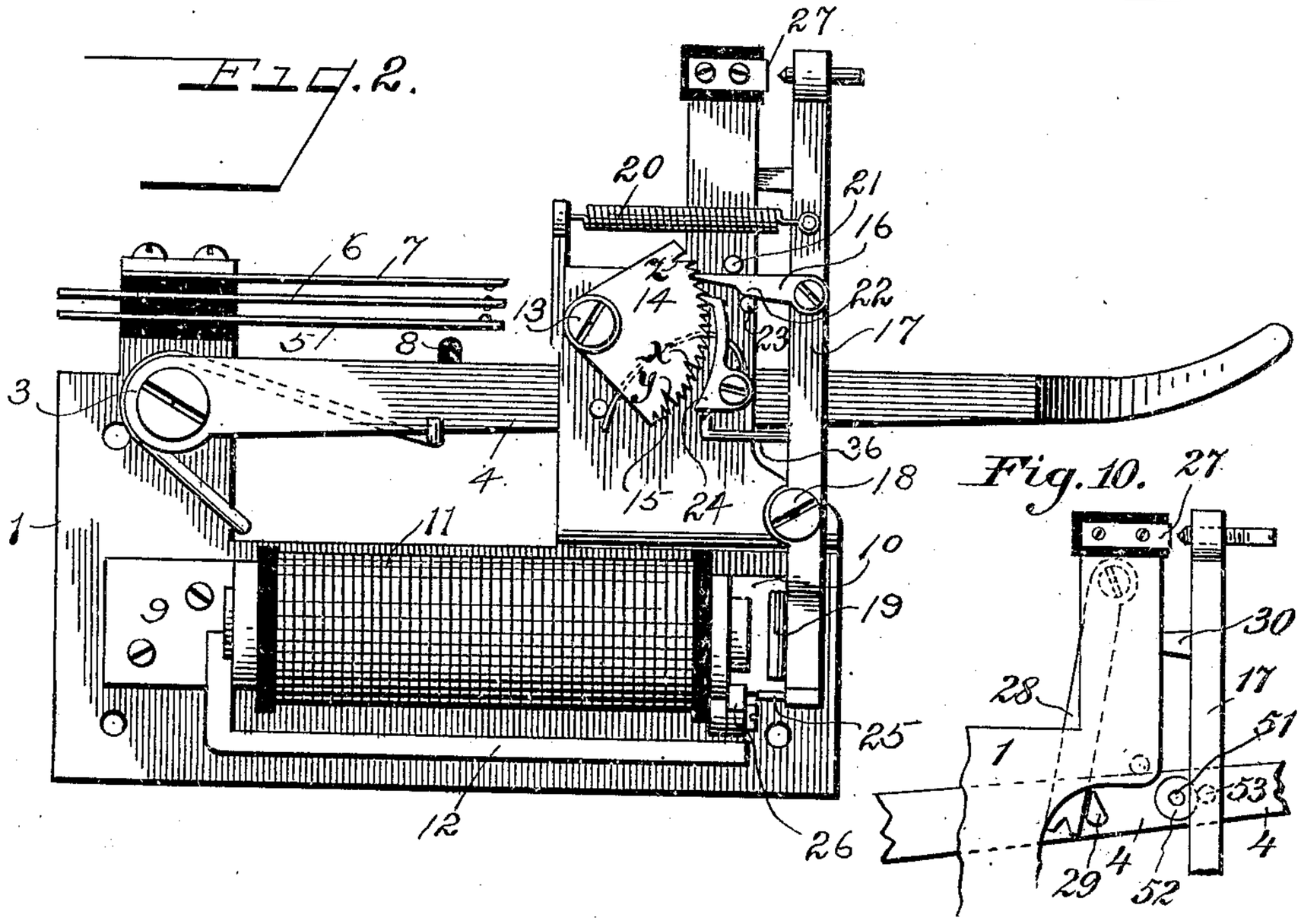

Fig. 10.

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3 SHEETS—SHEET 2.

Fig. 3.

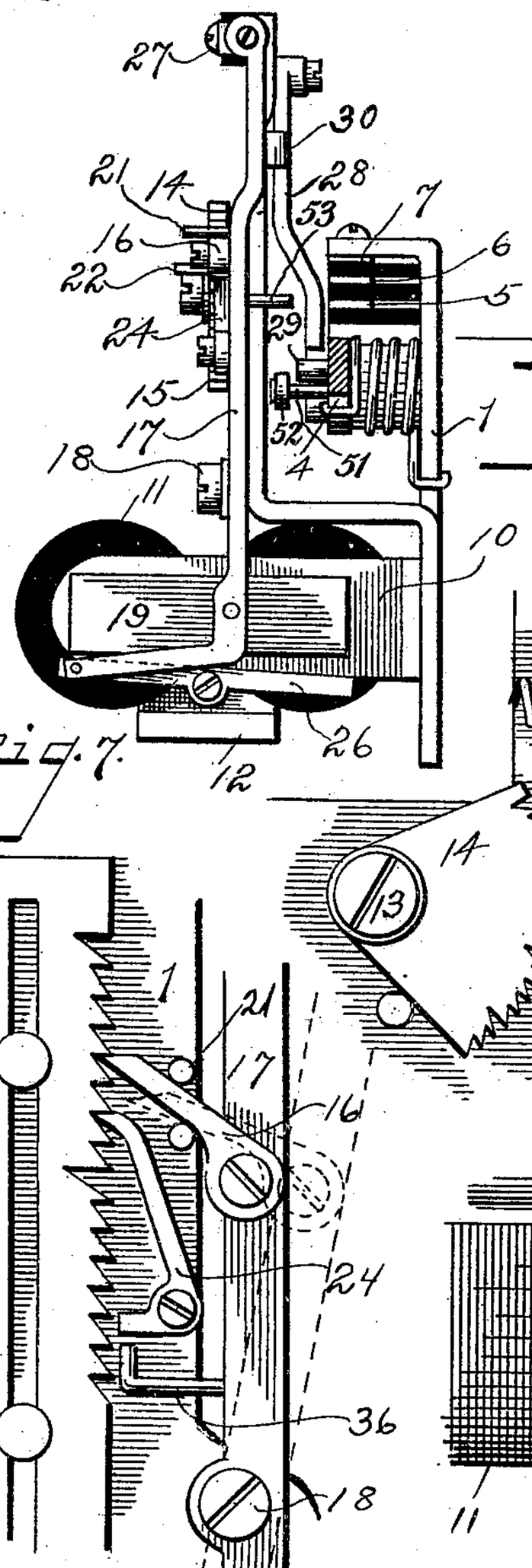


Fig. 7.

Fig. 4.

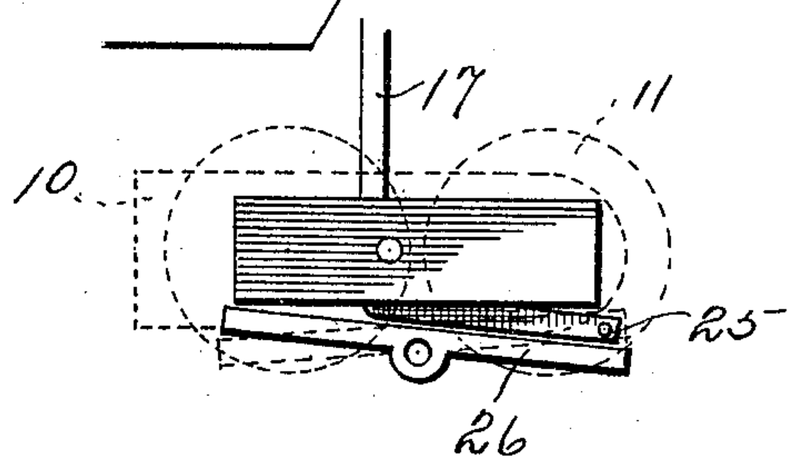
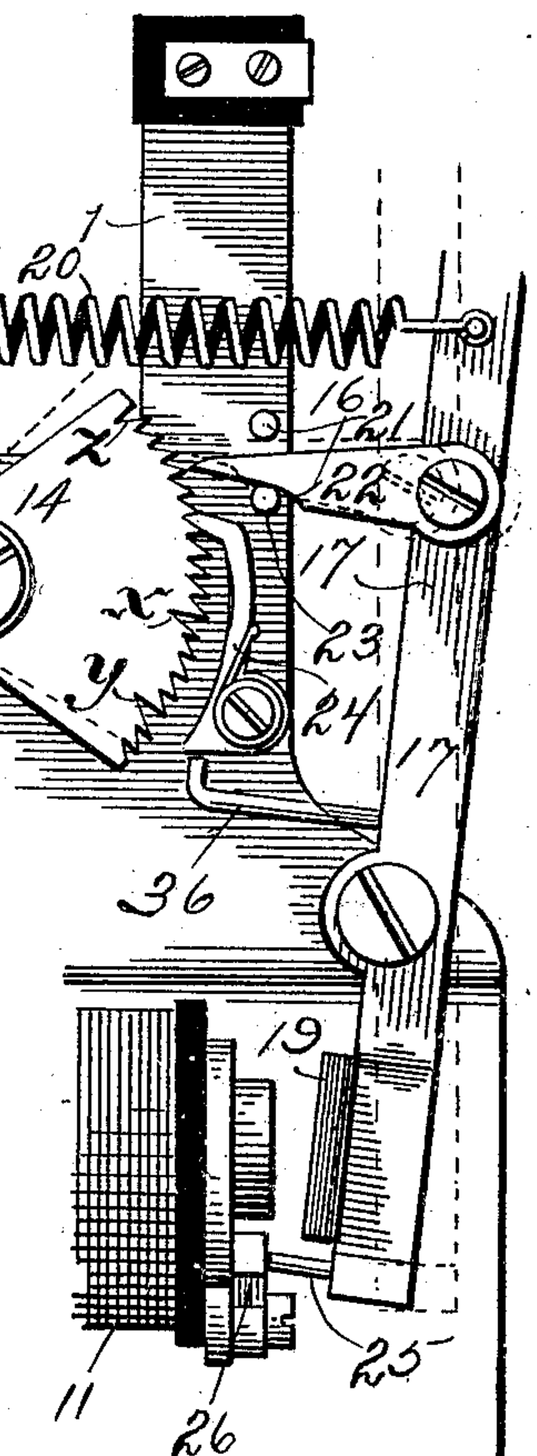


Fig. 6.

Fig. 5.



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3 SHEETS—SHEET 3.

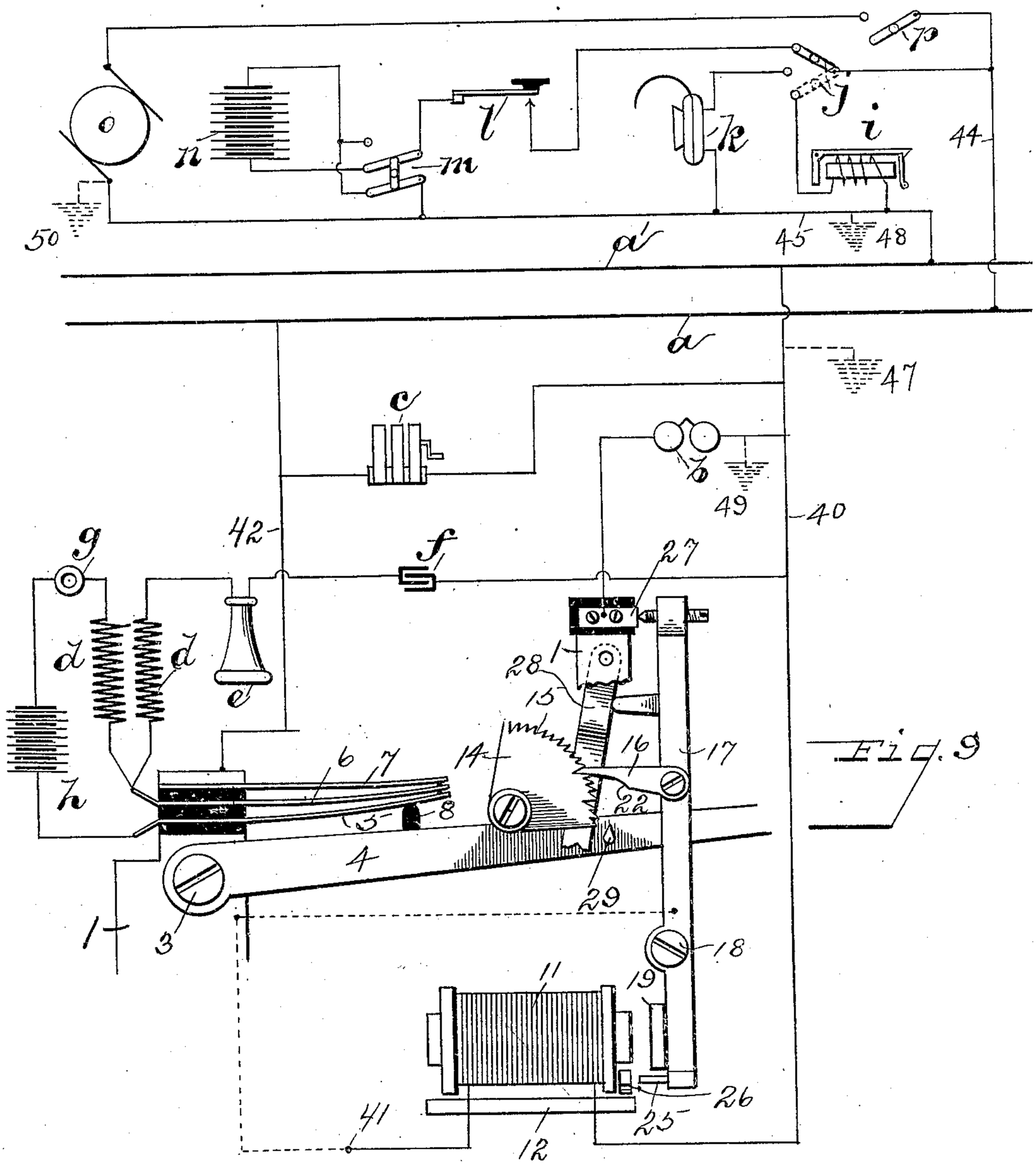

Fig. 9

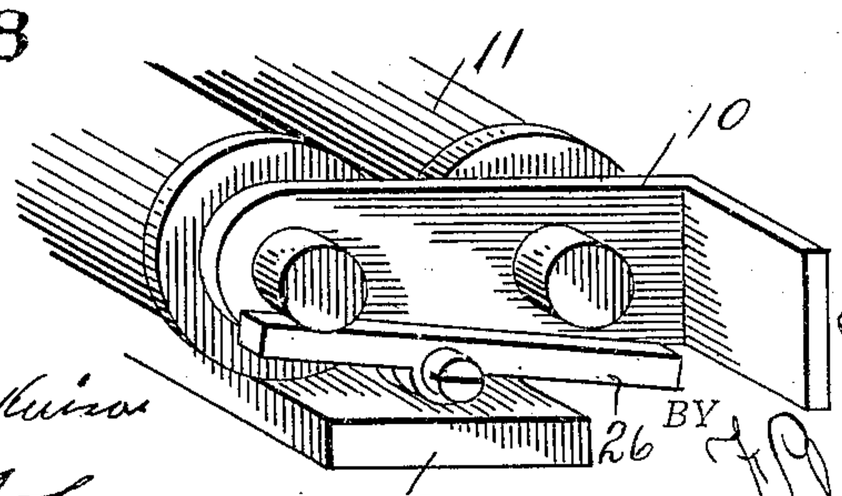

Fig. 8

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UNITED STATES PATENT OFFICE.

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LOCK-OUT DEVICE FOR PARTY-TELEPHONES.

953,340. Specification of Letters Patent. **Patented Mar. 29, 1910.**

Application filed April 27, 1908. Serial No. 429,306.

To all whom it may concern:

Be it known that I, DANIEL W. KNEISLY, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Lock-Out Devices for Party-Telephones, of which the following is a specification.

My invention relates to lockout devices for party line telephones and particularly to improvements on the device set forth in my former patent #860,920, dated July 23, 1907, and in my pending application, Serial No. 416,900.

The object of the invention is to provide a device of this character in which only the instrument selected from a series of instruments on the common line will be rung in calling the subscriber.

A further object is to provide a device whereby any subscriber other than the one called will be prevented from using his instrument until the line is returned to normal condition, thus preventing interruption of the conversation, and preventing the conversation being overheard by other parties on the same line.

Other objects are to provide means for returning the respective instruments to normal instantly, at the will of the operator, without the necessity of completing a series of step-up operations as is usual in such devices, and to accomplish the various objects with but a single break in the talking circuit at the subscriber's instrument.

Further objects are to simplify the structure as well as the means and mode of operation of such devices whereby they will not only be cheapened in construction, but will be more positive and efficient in operation, easily operated, and unlikely to get out of repair.

With the above primary and other incidental objects in view, as will appear from the specification, the invention consists of the means, mechanism, construction, and mode of operation, or their equivalents hereinafter described and set forth in the claims.

In the drawings Figure 1 is a rear view of the device showing the lock mechanism. Fig. 2 is a front view of the structure showing the selective apparatus. Fig. 3 is an end view of the assembled device. Fig. 4 is a detail view of the oscillating polarized armature. Fig. 5 is an enlarged detail view of the oscillating lever in operated step-up position. Fig. 6 is a similar view of the parts when operated to release the selective apparatus. Fig. 7 is an enlarged detail of a modification. Fig. 8 is a detail perspective view showing the relation of the magnets and polarized armature. Fig. 9 is a diagrammatic view of the various circuits. Fig. 10 is a detail view showing the ringing circuit breaking device.

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

The device shown in the drawings and herein described is designed to be one of a series of similar instruments located on a common or party telephone line, and is adapted to be operated from a central station, by a series of separated impulses sent over the line; each instrument being adapted to be released or brought into talking condition by different, predetermined number of separate impulses; the construction is such that only one instrument is ordinarily in talking circuit at a time, the remaining instruments of the line being maintained in inoperative condition, through certain interengaging parts engaging with and preventing the movement of the receiver hook when the receiver has been removed, to close the talking circuit.

In constructing the device there is employed a support or main frame 1 preferably of metal, but which might be of any other suitable material. Pivoted at 3 on the frame 1 is a receiver hook 4 of ordinary form and construction, adapted when in its elevated position to close a plurality of terminals or switch blades 5, 6 and 7, by the engagement therewith of an insulated finger 8 carried on the hook arm 4 as in Figs. 1 and 2. The respective blades 5, 6 and 7 are mounted on the frame 1 and are insulated from each other and from the frame, except 7 which is electrically engaged with the frame.

Supported on brackets 9 10 on the main frame is an electro magnet 11, bridged across the main line, and excited by current from the central station. A permanent magnet 12 is also supported on the bracket 9 and extends under the magnet 11. The bracket 9 is of iron connecting the cores of the respective coils of the magnet 11.

Pivoted at 13 on the frame 1 is an oscil-

lating segment 14 having in the periphery thereof a series of notches or ratchet serrations 15. The ratchet serrations 15 are engaged by an actuating pawl 16 carried on an oscillating lever 17 pivoted at 18 to the frame 1. The lever 17 carries below its pivotal point 18 an armature 19 attracted by the magnet 11 to oscillate said lever against the tension of a spring 20 which tends to return the lever to normal after each movement due to an electric impulse through the magnet 11.

The actuating pawl 16 engages the oscillating segment 14 above the level of the pivotal point, or eccentric therewith; whereby pressure upon said segment by the pawl due to the pull of the spring 20 upon the lever 17 will cause a revoluble movement of the segment. The direction of engagement of the pawl 16 and segment 14 is angular to a line tangent to the point of contact. The pawl 16 is pivoted to the lever 17, and is permitted a slight pivotal movement at each oscillation of the lever 17 due to the elevation of the particular notch of the segment 14 with which it is engaged. The movement of the segment is primarily caused by the eccentric engagement of the pawl 16 which presses upon the segment above the pivotal point thereof tending to rotate the segment. The movement of the segment and pawl however is limited to the distance of one tooth or notch at each operation by a pin 21 in the frame 1 which arrests or limits the upward movement of the pawl 16. The actuation of the segment 14 is further assisted by a cam surface 22 on the under side of the pawl 16 which during the forward movement of the pawl engages a pin 23 also in the frame 1, and serves to elevate the pawl. This is best illustrated in Fig. 5. Upon the oscillation of the lever 17 by the attraction of the magnet 11 the pawl 16 is withdrawn from engagement with the segment 14, and when the cam surface 22 has receded beyond the pin 23 the pawl 16 drops to a position to engage the next notch of the series as shown in solid lines in Fig. 5. When the electric current is broken, and the magnet 11 no longer attracts the armature 19, the spring 20 will return the lever 17 to normal causing the pawl 16 to engage the next tooth or notch of the series and thereby oscillate the segment 14 until arrested by the pin 21, as shown in dotted lines in Fig. 5. A spring actuated pawl 24 is pivoted to the main frame, and normally engages the ratchet teeth 15 of the segment 14 to retain the segment in its operated position.

The lower end of the lever 17 is turned at substantially right angles and is provided with a projecting pin 25. Pivoted to the bracket 10 is a tilting or oscillating polarized armature 26, controlled by the magnets 11 and 12 and normally projecting into the path of the lever 17 or in the present instance into the path of the pin 25 carried by said lever, and thus limiting the movement of said lever to a range sufficient to withdraw the pawl 16 from engagement with the segment and cause it to engage the next succeeding tooth or notch, but preventing the movement of the lever sufficient to release the pawl 24 to permit the return of the segment to normal, as hereinafter described. The upper extremity of the lever 17 is adapted to contact with a terminal 27, thereby closing the ringing circuit of which the frame 1 and lever 17 forms a part.

In the series 15 of notches in the segment 14 there are three notches of greater depth than the others, a deep notch x which varies in its relative location in each of the series of instruments on a common line, according to the number of steps or impulses required to bring the instrument into operative condition, a second similar deep notch y located in the same relative position in each instrument of the series, whereby all the instruments may be synchronously operated and a third notch z, the initial notch of the series 15 of less depth than the notches x and y but of greater depth than the remaining notches. The notch z is similarly located in each of the instruments on the line being the initial notch, the second notch being in each instance a shallow notch, the notch x being variable in its location and occupying a different position in each instrument while the notch y located near the subsequent end of the series is constant in its location being the same number of steps from z in every instrument.

Pivoted to the rear of the frame 1 is a swinging dog 28, adapted to engage a pin 29 in the receiver hook 4 and prevent the elevation of said hook as shown in dotted lines in Fig. 1. A finger 30 on the lever 17 engages the dog 28, when the actuating pawl 16 drops into anyone of the deep notches x, y, z, of the series 21, and presses the dog 28 out of the path of the pin 29 in the hook arm 4, thus permitting the hook to raise to close the talking circuits through the blades 5, 6 and 7. See Fig. 9. The adjustment of the parts is such that when the actuating pawl 16 is in the deep notches y or x, the ringing circuit between the lever 17 and the terminal 27 is complete through the contact of said parts, and the hook 4 is unlocked through the engagement of the finger 30 with the dog 28. However, the notch z being of less depth than x and y, the adjustment is such that when the pawl 16 is in said notch z the dog 28 will be pressed out of the path of the pin 29 by the finger 30, but on account of the less depth of said notch, the lever 17 will not contact the terminal 27 and the ringing circuit will remain open. When the finger 24 is in engagement with one of the

shallow notches, not only will the ringing circuit be broken by the lever 17 being held out of engagement with the terminal as in Fig. 2, but also the finger 30 will be held out of engagement with the dog 28, permitting the dog to swing into the path of the pin 28 and so lock the hook 4 against movement even though the receiver be removed therefrom. The normal position of all the instruments on the line is with the actuating pawl 16 in the initial deep notch *z*, which permits the lever 17 to oscillate sufficiently to cause the finger 30 to push the dog 28 out of the path of the pin 29 in the hook arm 4, thus allowing any subscriber to communicate with central by removing the receiver from the hook, permitting the hook to raise and close the talking circuit. However, when in this position the ringing circuit is open intermediate the lever 17 and the terminal 27, due to the initial or medium deep notch not being of sufficient depth to permit the contact of said parts, thus preventing any other subscriber's bell ringing when any one subscriber calls the central station. When the actuating pawl 16 is in the extreme deep notch *x* the lever 17 contacts the terminal 27 and the ringing circuit is complete, and the hook 4 is unlocked. This is also true at the engagement of the actuating pawl 16 in the deep notch *y*. The object of the deep notch *y* is to permit the instruments to be used for code ringing in the usual manner. In some instances the central station is closed during certain hours, and it is desirable to arrange the instruments on the line that there may be inter-communication over the common line between the respective instruments, independent of the central station. This may be done by stepping up the device until the actuating pawl 16 is in the third deep notch *y*, at which time the ringing circuits of each instrument will be closed and the respective receiver hooks unlocked.

After the respective devices have been stepped up to bring the desired instrument into the talking circuit, and the conversation finished it becomes necessary to return the devices to normal condition, preparatory to the next call. When it is desired to return the parts to normal, an impulse is sent over the line in reverse direction from the central station, thus reversing the poles of the electromagnet 11 and causing the polarized armature 26 to move on its pivot to the position indicated in Fig. 4 in which case it will be out of the path of the pin 25 and through the attraction of the magnet 11 and the armature 19 the lever 17 will be oscillated to withdraw the actuating pawl 16 from engagement with the segment 14; at the same time an arm 36 carried on the lever 17 will engage the pawl 24 and oscillate it to withdraw same from engagement with the segment 14 as in Fig. 6 thereby permitting the segment to return to normal position when the actuating pawl 16 will rest in the initial or medium deep notch *z* of the series as before described. It will thus be seen that the step-up or selecting operation and the release or return to normal operations are both accomplished by the oscillation of the lever 17 due to the attraction of the single armature 19 by the one magnet 11. Whether the oscillation of the lever accomplishes the step-up, or the release of the segment, is determined by the degree of movement thereof which in turn is determined by the position of the pivoted polarized armature which is moved into or out of the path of the lever 17 according to the direction in which the electric impulse is sent through the magnet 11. A limited movement of the lever 17 due to its arrest by said polarized armature projecting into the path thereof, will upon the return of the lever to normal cause the segment to be moved up the distance of one notch. However, the extreme movement of the lever will cause the release of the segment by not only withdrawing the actuating pawl, but also the retaining pawl 24. While the pawl 24 is shown operated by the arm 36 engaging the pawl beyond the pivotal point and operating by an upward movement, the pawl might be disengaged by a finger on the lever 17 adapted to engage the pawl above its pivot and pull it from engagement with the segment, as shown in the afore mentioned pending application.

It will be seen that the structure thus described greatly simplifies the construction of the device and materially reduces the working parts, thus simplifying the operation and rendering the device less liable to get out of order.

Circuits.—In Fig. 9 is illustrated diagrammatically the various circuits, and operating parts and connections, the central station apparatus being indicated at the top, and the subscriber's instrument at the bottom of said figure. *a* and a^1 is the main line, common to a number of subscribers' instruments. The magnet 11 is bridged across the line, the drop line 40 connecting with one terminal of the magnet 11, the opposite terminal being attached to the frame 1 as at 41. The second drop line 42 connects with the switch blade 7 which is in electrical contact with the frame 1, thus completing the circuit between opposite sides of the line *a*, a^1, through the magnet 11 and frame 1 as indicated in dotted lines Fig. 9. The subscriber's call bell *b* is bridged between the terminal 27 on the main frame 1, and the drop line 40, the circuit being from the line *a* through the drop 42 to the frame 1, through the frame 1 and lever 17 to the terminal 27 when the lever 17 con-

tacts therewith, thence through the bells *b* to the drop 40 and to the line a^1. The subscriber's calling magneto *c* is bridged between the drop lines 40 and 42. The receiver circuit extends between the blade 6 through the secondary of the coil *d* to the drop line 40, including in said circuit the receiver *e* and condenser *f*. The transmitter circuit extends from the switch blade 6 through the primary of the coil *d* to the switch blade 5, including the transmitter *g*, and battery *h*. At the central station, are the two lines 44, and 45 connecting with the main line through the usual calling and answering jacks, not shown in the present drawing. The lines 44, 45 connect with the sides *a*, a^1 respectively of the main line. The usual annunciator drop is indicated at *i*, and is normally bridged across the lines 44, 45 through a switch *j*; *k* is the operator's instrument; *l* is a key for sending separate selecting impulses over the line to operate the subscriber's selector mechanism. A pole changer *m* is provided to reverse the direction of the current from the battery or other source of energy *n*; *o* is a generator, adapted to be brought into circuit by the closing of the switch *p*.

Operation.—When in normal position as indicated in the drawings with the actuating pawl 16 engaging the notch *z* the receiver hook is unlocked as indicated by dotted lines Fig. 1. The subscriber operates the magneto *c*, and removes his receiver *e* from the hook allowing the hook to be elevated by the action of the spring 43, to close the circuits between the switch blades, 5, 6 and 7 as in Fig. 9. This call is indicated to the central operator by the drop *i*, the operator moving the switch *j* to cut the drop *i* out of circuit and to bring the operator's instrument *k* into the talking circuit. The transmitter circuit of the subscriber's instrument is closed through the switch blades 5 and 6; the receiver circuit being from the line *a* through the drop 42, the blade 7 to the blade 6, thence through the coil *d*, the receiver *e* and condenser *f* to the drop 40 and to the line a^1. The break in the ringing circuit between the lever 17 and the terminal 27 when the parts are in normal position, prevents the current generated by the magneto *c* to call central, short circuiting through the instrument to ring the bells *b* of the calling or any other instrument on the line. Upon receiving the subscriber's call, the operator will move the switch *j* to cut out the operator's instrument *k* and to bring into the circuit the impulse sending key *l*.

The operator will select, or unlock the desired instrument by operating the key *l* to close the circuit a predetermined number of times, as may be necessary to bring the actuating pawl 16 into the deep notch *x*. At each closure of the key *l* the electric impulse will pass from the battery *n* through the key *l* and switch *j* to the line 44 thence to the main line *a* and over the drop lines 42 and through the magnets 11 of every instrument on the line, over the drop lines 40, main a^1 and drop 45 to the battery completing the circuit. Each impulse exciting the magnet 11 will cause the oscillatory segment 14 to be stepped up one notch, as before described. At the first step or impulse, the actuating pawl 16 of each instrument on the line will engage the second notch which in every instrument is a shallow one. This will hold the lever 17 in such relation that the dog 28 will be disengaged by the finger 30, and will be permitted to swing into the path of the pin 29 in every instrument on the line. At each subsequent step the actuating pawl 16 of some one of the series of instruments will engage the notch *x*, said notch *x* being differently located in each instrument. The instrument of Fig. 2 of the drawings is the number ten instrument, being brought into operation on the eleventh step or impulse. The first step serves to lock every instrument, while the tenth subsequent step will release the illustrated instrument by the pawl 16 engaging the notch *x* which will permit the lever 17 to oscillate to close the ringing circuit by the contact of the lever 17 with the terminal 27, and will release the receiver hook by the engagement of the finger 30 with the locking dog 28. The subscriber is now called by closing the switch *p* thus sending the current from the generator *o* over the line 44 and *a* to 42, thence through the frame 1, and lever 17, the terminal 27, through the bell as indicated at *b*, to the drop line 40 to the return main a^1 and the line 45 to the opposite pole of the generator *o*. At the time the pawl 16 of the illustrated or called instrument engages the notch *x*, the pawl 16 of every other instrument on the line is engaged with a shallow notch, and the ringing circuit is broken, and the receiver hook is locked in inoperative position as described.

When it is desired to return the instruments to normal after the completion of the conversation, the pole changer *m* is operated and the key *l* is closed to send an impulse in the opposite direction over the line and through the respective magnets 11. The changed polarity of the magnet 11, will cause an oscillation of the polarized armature 26 causing said armature 26 to move out of the path of the lever 17 thereby permitting said lever 17 to oscillate through the attraction of the magnet 11 and armature 19 on said lever, to disengage the actuating pawl 16 from the notched segment 17 and to withdraw the retaining pawl 24 from engagement with the notched segment,

by means of the arm 36 carried by the lever 17. When so disengaged the segment will be returned to normal by gravity. While a double metallic circuit a, a^1 has been described, the main line wire a^1 might be dispensed with, under certain conditions, and the lines 40 and 45 may be grounded as at 47 and 48 in Fig. 9, thus completing the circuits through ground instead of through the line a^1. If metallic talking and selecting circuits are desired, the ringing may be accomplished through ground as indicated at 49 and 50 in Fig. 9. Thus but two conductors are required to form both the operating and talking circuits, one of which conductors may be the ground, or two metallic conductors may be employed with an additional grounded ringing circuit. However the preferred form is two metallic conductors as shown in solid lines in the drawing. The construction is also applicable to common return systems of telephony. The notch Y is so located that the teeth 23 of each instrument on the line will enter the notch Y simultaneously, thus unlocking every instrument on the line, and closing all the ringing circuits, whereby intercommunication may be had, the desired instrument being indicated by code ringing. As shown in the drawing all the instruments will be thus unlocked on the eleventh step.

In order that the ringing circuit will be broken when the receiver and transmitter circuit are in use, a stud 51 is provided, projecting from the hook lever 4, and carrying a roller 52, which roller is adapted to engage a pin 53 in the lever 17 when the hook 4 is in its elevated position, and thereby oscillate said lever to break the contact of the lever 17 and the terminal 27. This construction is best shown in Fig. 3. In calling a second party on the same party line the operation is the same as if the calling and called parties were on different lines. The calling party removes his receiver and instructs the operator in the usual manner. It is not necessary that the subscriber should hang up his receiver again while the party is being called, but to the contrary, he should keep the receiver off the hook in the customary manner. The operator will proceed to select the desired instrument on the calling line in the manner as described, and upon completion of the conversation the instruments will be returned to normal, by the usual operation of reversing the direction of the current.

It is to be noted that no adjustment of resistance according to the position of the instrument on the line, or the strength of current is necessary. The locking, unlocking, and selecting operations are mechanical, and while actuated by the electrical impulses, the operations are performed independent of the strength of the current, the instrument being unaffected by any variations thereof, providing it is always of sufficient strength to excite the magnet 11 to attract the respective armatures.

From the above description it will be apparent that there is thus produced a device of the character described, possessing the particular features of advantage before enumerated as desirable, but which, obviously is susceptible of modification in its form, proportion, detail construction and arrangement of parts, without departing from the principle involved or sacrificing any of its advantages.

Having thus described my invention, I claim,

1. In a device as described, the combination with lock mechanism, of a controlling device, therefor comprising a pivoted sector having points thereon at different distances from the axis, a pivoted lever, means on said lever engaging the said sector, whereby said lever will be varied in its relation to stationary parts of the device, as the engagement of said lever with said sector is at a point of greater or less distance from the axis and connections between said lever and lock mechanism, substantially as specified.

2. In a device as described, lock mechanism, a pivoted lever, controlling said lock mechanism, means for oscillating said lever, a variable stop for said lever, comprising a pivoted sector, and means for varying said stop, whereby said lever may be oscillated a greater or less degree, substantially as specified.

3. In a device as described, lock mechanism, a pivoted lever controlling said mechanism, means for oscillating said lever, a variable stop to limit the oscillations of said lever in one direction, comprising a pivoted segment, having portions engaged by said lever at different distances from the pivotal point, thereby permitting said lever to oscillate throughout a greater or less degree, and means to bring different portions of said segment to the engaging point.

4. In a device as described, a movable member adapted by its movement to close electric circuits, a swinging dog adapted to project in the path of said movable member to prevent the circuit closing movement thereof, a pivoted lever adapted upon oscillation to move said swinging dog to release said movable member, a variable stop to limit the oscillations of said lever in one direction, comprising a pivoted sector, whereby said lever will be held inoperative, except at predetermined points in the variation of said stop, at which points of engagement the lever will be permitted to oscillate sufficiently to move said swinging dog to inoperative position, and means to oscillate said lever and vary said stop sector, substantially as specified.

5. In a device as described, circuit closing mechanism, means to lock said mechanism in inoperative position, means to release said mechanism, including a pivoted lever, a pivoted sector, adapted to limit the movement of said lever, engaging points on said sector at different distances from the center, whereby said lever may be controlled through varying degrees of oscillation, said lever being adapted on its extreme degree of oscillation toward said sector to release said lock mechanism, and means to oscillate both said sector and pivoted lever, substantially as specified.

6. In a device as described, circuit closing mechanism, means to lock said mechanism in inoperative position, controlling mechanism therefor, including a pivoted lever adapted when oscillated to extreme position in one direction to disengage said circuit lock mechanism, and when oscillated to extreme opposite position to cause the return of the controlling mechanism to normal, variable stops to limit the oscillation of said lever in either direction, and means to actuate said stops, substantially as specified.

7. In a device as described, circuit closing means, locking mechanism therefor, controlling mechanism including a pivoted lever, means for oscillating said lever, stops to limit the oscillation of said lever in either direction, means to move said stops whereby said lever may be permitted an additional degree of oscillation in either direction, said lever being adapted by such additional oscillation in one direction to release said lock mechanism, and in the other direction to permit the return of the controlling mechanism to normal.

8. In a device as described, circuit closing means, lock mechanism therefor, a selector mechanism controlling same, and including an oscillating notched segment, one of the notches thereof being of greater depth than other notches therein, a pivoted lever, a pawl carried by said lever and engaging said segment above the level of the pivotal point, means to oscillate said lever whereby said segment will be oscillated through a step by step movement by the engagement of said pawl therewith, means whereby said lock mechanism will be released and the circuits closed when said pawl engages the deep notch of said segment, and means to return the segment to normal, substantially as specified.

9. In a device as described, the combination with lock out mechanism, of a selector mechanism controlling the same and comprising a pivoted sector, having a series of recesses in the edge thereof, one of said recesses being of greater depth than other recesses thereof, a pawl adapted to successively engage said recesses, and means for releasing said locking mechanism when said pawl enters the deep recess, substantially as specified.

10. In a device as described, the combination with lock out mechanism, of a selector mechanism controlling the same and comprising an oscillatory segment, having a series of recesses in the edge thereof, one of said recesses being of greater depth than other recesses thereof, a pawl adapted to successively engage said recesses, the engagement of said pawl being at an inclination to a line tangent at the point of engagement, and means for releasing the lock mechanism when said pawl enters the deep recess, substantially as specified.

11. In a device as described, the combination with lock out mechanism, of a selector mechanism controlling the same, and comprising an oscillatory segment, having a series of recesses in the edge thereof, one of said recesses being of greater depth than other recesses thereof, a pawl adapted to successively engage said recesses, means for reciprocating said pawl, a cam face, adapted to elevate said pawl during its forward movement, whereby said segment will be advanced thereby, and means for releasing the lock mechanism when the pawl enters the deep notch, substantially as specified.

12. In a device as described, the combination with lock out mechanism, of a selector mechanism controlling the same, and comprising an oscillatory segment, having a series of recesses in the edge thereof, one of said recesses being of greater depth than other recesses thereof, a pawl adapted to successively engage said recesses, means for reciprocating said pawl, whereby said pawl will at each movement engage the next succeeding recess and oscillate said segment during its forward movement, and a stop to limit the movement of said pawl whereby the segment will oscillate at each operation a distance of one recess, and means for releasing the locking mechanism when the pawl enters the deep notch, substantially as specified.

13. In a device as described, the combination with lock mechanism, of a selector mechanism controlling same and comprising a movable stop member, having a series of recesses therein, one of said recesses being of greater depth than other recesses thereof, an oscillating lever, a pawl carried by said lever and engaging the recesses of said movable member in a direction angular to the path of travel thereof, whereby said member will be actuated at each oscillation of said lever, and means to release said lock mechanism when said pawl engages said deep recess, substantially as specified.

14. In a device as described the combination with lock mechanism, of a selector mechanism controlling same and comprising a movable stop member, having a series of re-

cesses therein, one of said recesses being of greater depth than other recesses thereof, an oscillating lever, a pawl carried by said lever, and adapted to be reciprocated by the oscillations of said lever, and engaging the recesses of said movable member on its forward movement, means whereby the pawl will be elevated during its movement while engaged in said recess, and means to limit the movement of said pawl, and means to release said lock mechanism when said pawl engages the deep recess, substantially as specificed.

15. In a device as described, the combination with lock mechanism, of a selector mechanism controlling same and comprising a movable stop member, having a series of recesses therein, one of said recesses being of greater depth than other recesses thereof, an oscillating lever, a pawl carried by said lever, and adapted to be reciprocated by the oscillation of said lever, and engaging the recesses of said movable member on its forward movement, a cam face formed on said pawl, a pin engaged by said cam face to elevate said pawl during its forward movement whereby said movable member will be advanced the distance of one recess, and means to release the lock mechanism when said pawl engages the deep recess, substantially as specified.

16. In a device as described, the combination with lock mechanism, of a selector mechanism controlling same and comprising a movable stop member, having a series of recesses therein, one of said recesses being of greater depth than other recesses thereof, an oscillating lever, a pawl carried by said lever, and engaging the recesses of said member to advance same at each oscillation of the lever, an electromagnet, an armature attracted thereby at each impulse through said magnet, and adapted to oscillate said lever, a stop in the path of said lever to limit the oscillation thereof, means to move said stop from the path of the lever whereby the lever will be permitted an additional degree of oscillation, substantially as specified.

17. In a device as described, the combination with lock mechanism, a selector mechanism controlling same and comprising a movable stop member, having a series of recesses therein, one of said recesses being of greater depth than other recesses thereof, an oscillating lever, a pawl carried by said lever, and engaging the recesses of said member to advance same at each oscillation of the lever, an electromagnet, an armature attracted thereby at each impulse through said magnet, and adapted to oscillate said lever, a stop in the path of said lever to limit the oscillation thereof, said stop comprising a polarized armature, attracted into the path of said lever when the electric impulses are sent through the magnet in one direction, and moved out of the path of the lever when the direction of the electric impulses is reversed, substantially as specified.

In testimony whereof, I have hereunto set my hand this 11th day of April A. D. 1908.

DANIEL W. KNEISLY.

Witnesses:
HARRY F. NOLAN,
F. L. WALKER.