

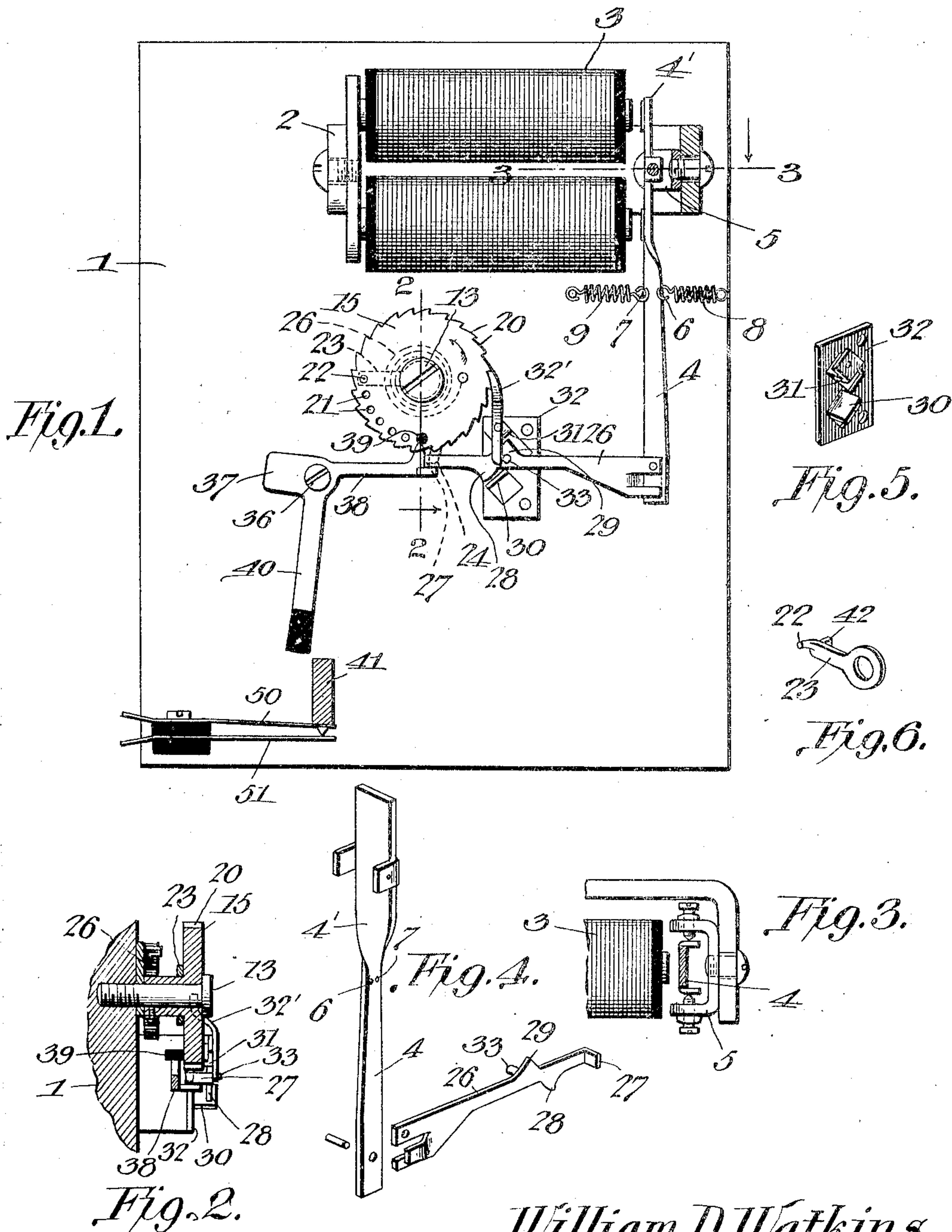
No. 821,069.

PATENTED MAY 22, 1906.

W. D. WATKINS.
TELEPHONE SELECTING DEVICE.

APPLICATION FILED MAY 16, 1904.

2 SHEETS—SHEET 1.



Witnesses
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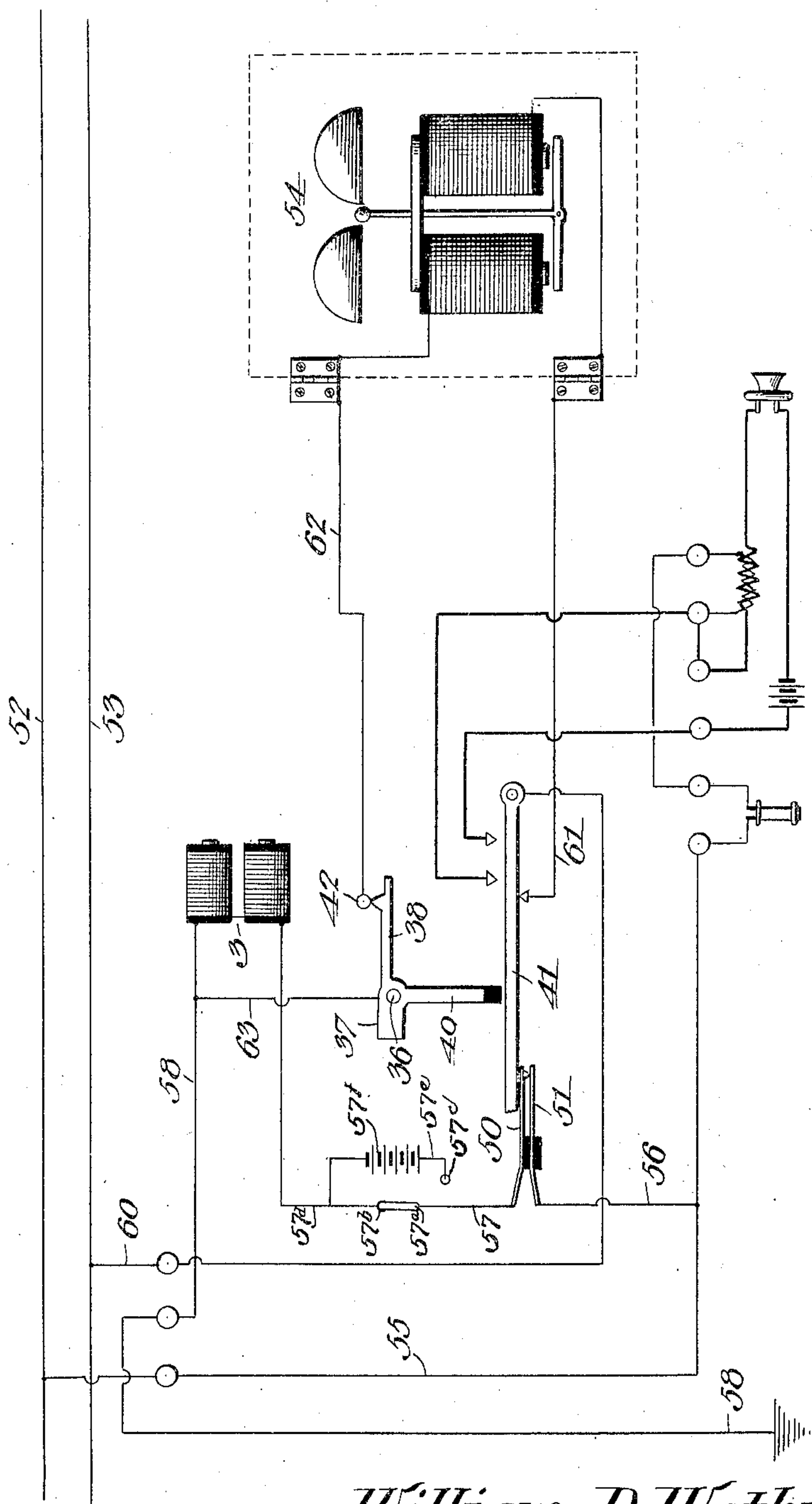
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2 SHEETS—SHEET 2.

Fig. 7.



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UNITED STATES PATENT OFFICE.

WILLIAM DAVID WATKINS, OF SAN JOSE, CALIFORNIA.

TELEPHONE SELECTING DEVICE.

No. 821,069.

Specification of Letters Patent.

Patented May 22, 1906.

Application filed May 16, 1904. Serial No. 203,225.

To all whom it may concern:

Be it known that I, WILLIAM DAVID WATKINS, a citizen of the United States, residing at San Jose, in the county of Santa Clara and State of California, have invented a new and useful Telephone Selecting Device, of which the following is a specification.

This invention relates to improvements in telephone selecting apparatus, and has for one of its objects to provide an improved selecting and lock-out mechanism, which may be placed on a party-line and so arranged that the talking-circuits of all of the subscribers except those in conversation will be cut out and it will be impossible for any subscriber along the line to listen to a conversation or break in on a conversation while the line is in use.

A further object of the invention is to provide an improved selecting apparatus of the most simple and economical construction in which the selecting apparatus is of such nature as to permit of its manufacture in large quantities, all of the parts being interchangeable and provision being made for properly adjusting each separate selector in accordance with the number of the station at which it is to be placed.

A further object of the invention is to construct a selector of such nature that when placed in the local stations of a party-line the beginning of operations by one subscriber in sending impulses along the line for the purpose of calling another subscriber will immediately lock out every other subscriber along that line with the exception of the one who is calling, the calling subscriber having first removed his receiver from the hook and placed the hook beyond the control of the lock-out mechanism.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in the novel construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the same.

In the accompanying drawings, Figure 1 is an elevation of a telephone selecting and lock-out mechanism constructed in accordance with the invention. Fig. 2 is a transverse

sectional elevation of the same on the line 2 2 of Fig. 1. Fig. 3 is a sectional plan view of the base of the mechanism on the line 3 3 of Fig. 1. Fig. 4 is a detail perspective view of the armature and the pawl-carrying bar detached. Fig. 5 is a detail perspective view of a pair of cams for acting on the pawl-bar. Fig. 6 is a similar view of an adjustable arm by which the selecting and lock-out arm is operated. Fig. 7 is a diagram of the wiring system employed.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The several parts of the selecting mechanism are supported on a suitable base 1, that has at its upper end a projecting lug or lugs 2 for the support of an electromagnet 3. The armature-lever 4 is pivotally mounted in a small bracket 5, that is supported by the permanent magnet, and said lever is formed of a single piece of soft iron that is twisted near its upper end so as to present a flat polarized armature 4' to the poles of the magnet. In the armature-lever are formed two openings 6 and 7, serving as connections for the ends of armature-springs 8 and 9, that serve to hold the armature-lever in a central position with its upper portion parallel with the two poles of the magnet.

On a pivot-stud 13, that is secured to the base, is mounted a hub portion of a toothed selector-disk 15, that is provided with peripheral teeth 20, all of the same depth and corresponding in number to the number of openings 21 that are arranged in an arcuate row near the periphery of said disk, these openings serving to receive a pin 22, that is carried by an arm 23, pivotally mounted on the hub of the disk. The disk 15 is also provided with an enlarged projecting tooth or lug 24, which determines the initial position of the disk, being the position to which it is returned after each selecting operation, said disk being moved in the direction indicated by the arrow during the selecting movement and being returned by a spiral spring 26, secured at its inner end to the hub of the disk and at its outer end to the fixed base by lugs projecting from said base.

To the lower end of armature-lever 4 is pivoted a pawl-bar 26, having at its outer end a pawl 27, adapted to engage the teeth of the disk, and in normal position the projecting tooth 24 will rest against this pawl and pre-

vent further movement of the disk under the influence of its spring. The pawl-carrying bar is also formed of a single bar or strip of metal, and its end is slit, and one of the arms thus
 5 formed is bent outward, so as to engage against the opposite side of the armature, and thus prevent independent lateral play of the pawl-bar. The pawl-bar is provided with two cams 28 and 29, that project, respectively,
 10 from the lower and upper faces of the pawl-bar and are disposed at some distance from the pawl 27. The pawl-bar is guided between two stationary cams 30 and 31, that are preferably
 15 formed integral with a metallic plate 32, the cam 30 coacting with the cam 28 to elevate the pawl-bar and the cam 31 serving in like manner on the cam 29 to depress the pawl-bar. To the upper cam 31, or at any other convenient
 20 point, is pivoted a holding-pawl 32', that engages with the teeth of the selector-disk and serves to retain the same in the position to which it is moved by the pawl 27, and the tail of the pawl 32' is disposed in the path of
 25 movement of a pin 33, that projects laterally from the pawl-carrying bar, and when said carrying-bar is moved inward, or in the direction of the selector-disk, at the completion of a selecting operation the pin will engage the
 30 tail of the pawl and will move said pawl from engagement with the teeth of the ratchet-disk, allowing the same to return to its normal position under the influence of spring 26.

On the base-plate is pivoted a stud 36, having a bell-crank lever 37. The horizontal
 35 arm 38 of the bell-crank lever has a rounded or pointed end portion that normally rests on a pin 39, formed of insulating material and carried by the selector-disk. The approximately vertical arm 40 of the bell-crank lever
 40 is weighted, as by a block of insulating material, and is disposed immediately above and to one side of the receiver-hook switch 41, and if the pin 39 should pass from above the end of arm 38 the bell-crank lever would
 45 move by gravity to a position immediately over the receiver-hook switch, and thus prevent upward movement of said switch. The arm 38 may further be depressed by means
 50 of an arm 42, that projects from the end of arm 23, so that as the selector-disk turns and carries with it the arm 23 the bell-crank lever will be depressed and the receiver-hook switch released, and the receiving-hook may
 55 then rise in the usual manner when the receiver is removed and complete the talking-circuit. In addition to the usual contacts under the control of the receiver-hook switch there are two contacts 50 and 51, that
 60 normally are maintained in closed position by the receiver-hook switch when the receiver is on the hook.

To render the operation of the apparatus clear, a diagram of the main wiring system is shown. The two line-wires 52 and 53 are
 65 connected to all of the stations along the line,

and at each local station is a call-bell 54 and the usual transmitter and receiver, together with such other apparatus as may be necessary.

The wire 55 is connected by a wire 56 to 70 the contact 51, and from contact 50 leads a wire 57, terminating at a switch 57^a, which may be turned to engage a contact 57^b or a contact 57^c. Normally the switch is in engagement with the contact 57^b, and the circuit is closed from thence through wire 57^d to the electromagnet 3.

From the contact 57^c extends a wire 57^e, in which is connected a battery 57^f, and the opposite terminal of the battery is connected 80 to the wire 57^d, so that when necessary the switch 57^a may be turned to engage contact 57^b, and thus connect the battery in the line.

When a subscriber desires to call another subscriber, he moves the switch 57^a from its 85 normal position into contact with the switch-point 57^c, and thus closes a circuit through the battery 57^f. This circuit may be traced from the ground through wire 58 to electromagnet 3, wire 57^d, wire 57^e, battery 57^f, 90 contact 57^c, switch 57^a, wire 57, contacts 50 51, wire 56, wire 55, line-wire 52 to the corresponding local wires at all of the other stations along the line. The circuit is closed for a number of times corresponding to the 95 number of the station to be called. At the first closing of the circuit and the first movement of all of the selector-disks all of the pins 39 will move away from the arms 38 and the bell-crank levers will all move over the re- 100 ceiver-hook switches and hold the same from movement to circuit-closing position. The calling subscriber removes his receiver from the hook prior to the calling operation, so that his phone is beyond the control of the 105 apparatus, while all of the other receiver-hook switches on the line are locked. If the station to be called is number six, there will be six impulses sent along the line and the selector-disk 15 will be moved to the extent 110 of six teeth, gradually moving the arm 42 to a position over the arm 38 of bell-crank lever 37 and closing the calling-circuit. Should the subscriber's number be five, it is necessary to send five impulses only along the line 115 to bring the arm 42 of subscriber number 5 to circuit-closing position, and so on throughout the series of subscribers, it being necessary merely to adjust the pin 22 of the arm 23 into the proper opening of the disk. 120

To accomplish the ringing of the bell 54, an alternating current is sent out along wire 53, and the circuit may be traced through wire 60, receiver-hook switch 41, wire 61, to bell 54, wire 62 to pin 42, (through the whole of 125 the selecting mechanism, if necessary,) bell-crank lever 37, wire 63, and wire 58 to ground, thus ringing the bell of the called subscriber, while all of the other bells remain silent and all of the receiver-hook switches, except those of 130

the calling and the called subscriber, will be locked from movement, so that no person along the line can overhear the conversation.

A direct current sent along wire 52 to operate the selecting mechanism is of such character as to render only the upper pole of the magnet operable, and it attracts the upper end of the armature a number of times equal to the number of the station to be called, the limit of movement of such armature being from its position shown in Fig. 1 to an angular position to be assumed when the upper end of the armature comes into contact with the upper poles of the electromagnet. The result of this movement is that the pawl 27 engages with the successive teeth 20 of the selector-disk, and at each movement the cam 28 of the pawl-bar will ride up the cam 30, and the pawl will become jammed in the tooth or in the space between two teeth, and thus prevent any excessive movement of the disk under its acquired momentum. Movement in the opposite direction will be under the influence of one of the armature-springs, and each time the upper pole of the magnet attracts the armature the disk will be turned to the extent of a single tooth. After the completion of the calling operation a direct current is sent out along the line, this time in the reverse order, and the lower pole of the electromagnet becomes operative and by attracting the armature below the pivot-point of the latter will cause an extended inward movement of the pawl-carrying bar, and during this movement the cam 29 of the pawl-bar will ride against the cam 31 and force the outer end of the pawl-bar down. The outer end of the pawl-bar depresses arm 38 of the bell-crank lever, and outward movement will cause such bell-crank lever to positively move away from the pin 42 should there be any tendency of the latter to stick at this point and prevent return movement of the disk. At the same time the pin 33 of the pawl-bar will engage the tail of the pawl 32' and move said pawl from engagement with the teeth of the selector-disk, permitting the latter to assume its normal position.

While the device has been described as used in connection with telephones; it is to be understood that it may be employed as a separate signaling system when desired without departing from the invention.

Having thus described the invention, what is claimed is—

1. A receiver-hook lock, including a pivotally-mounted lever, a ratchet-disk, a pair of spaced pins carried thereby, one of which normally engages and holds the lever in unlocking position, said pin being formed of insulating material and serving when in engagement with the lever to break the signal-circuit of the telephone and means for turning the disk to first permit automatic locking movement of the lever and maintain the same locked until the second pin engages said lever and moves it to release position.

2. In selecting mechanism, a toothed disk mounted for rotative movement, a pawl engaging the same, a pawl-carrying bar having upper and lower cam-shoulders, a pair of stationary cams to be engaged by said shoulders, an armature connected to the pawl-bar, an electromagnet for operating the armature, a locking-pawl for holding the disk in the position to which it is moved, and means on the pawl-bar for moving said locking-pawl to release position.

3. In selecting mechanism, a toothed disk, a bell-crank lever, a pair of pins carried by the disk, one of which is insulated, and the other a conductor, said pins being adapted to engage the lever, a pawl, carrying bar having a pair of cam-shoulders, a pair of stationary cams with which said shoulders engage, a locking-pawl, a pin or lug carried by the bar and engaging said locking-pawl, a polarized armature connected to the bar, and an electromagnet for operating the armature.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM DAVID WATKINS.

Witnesses:

J. W. BOLSTER,
J. E. HOBLET.