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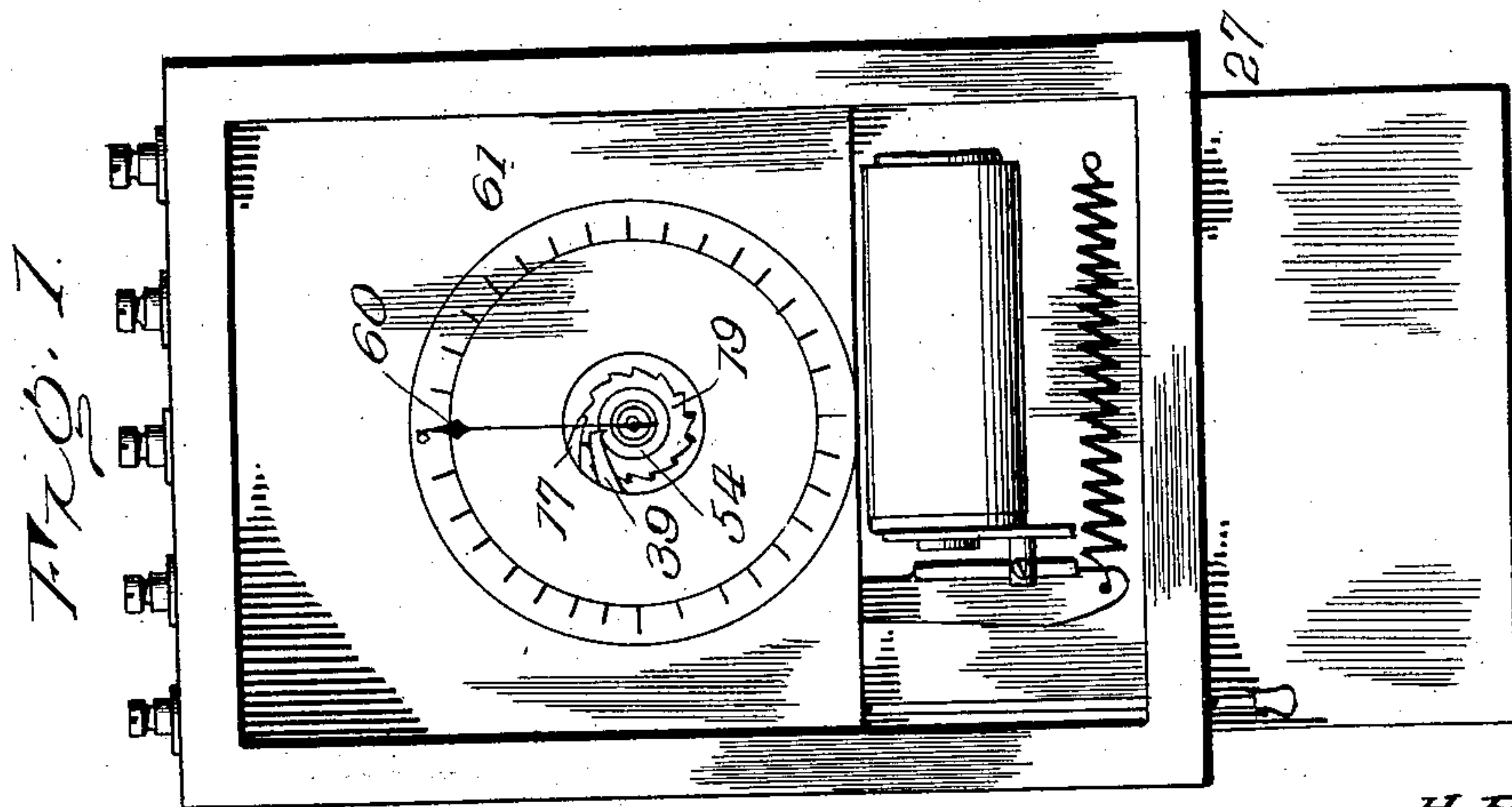
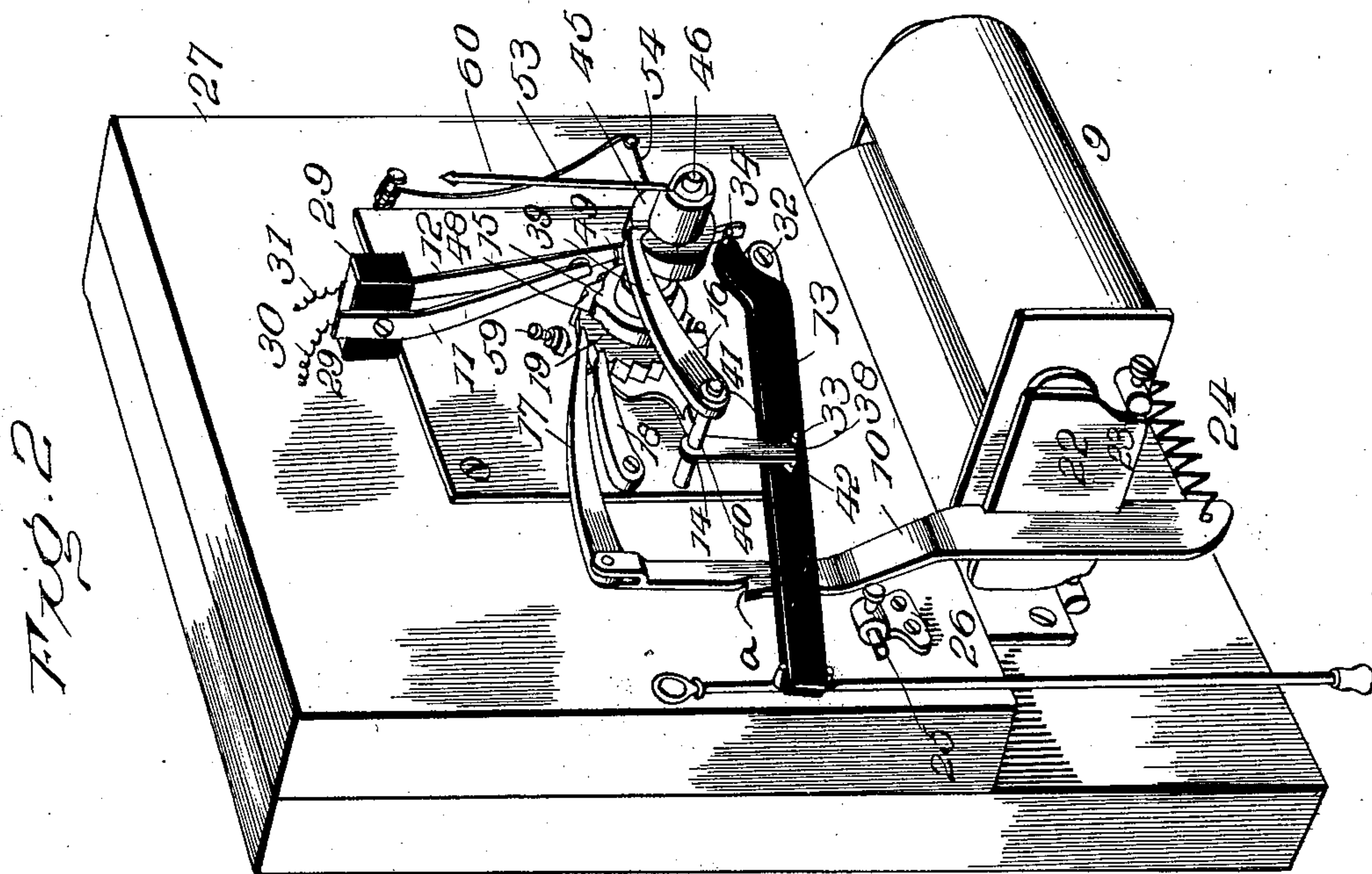
H. REDMON, R. L. HALL & R. H. CONWAY.

TELEPHONE SYSTEM.

APPLICATION FILED NOV. 10, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses

J. M. M. M.
Gladys L. Thompson

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R. H. R. R.

Inventor

H. Redmon
R. L. Hall
R. H. Conway

Attorneys

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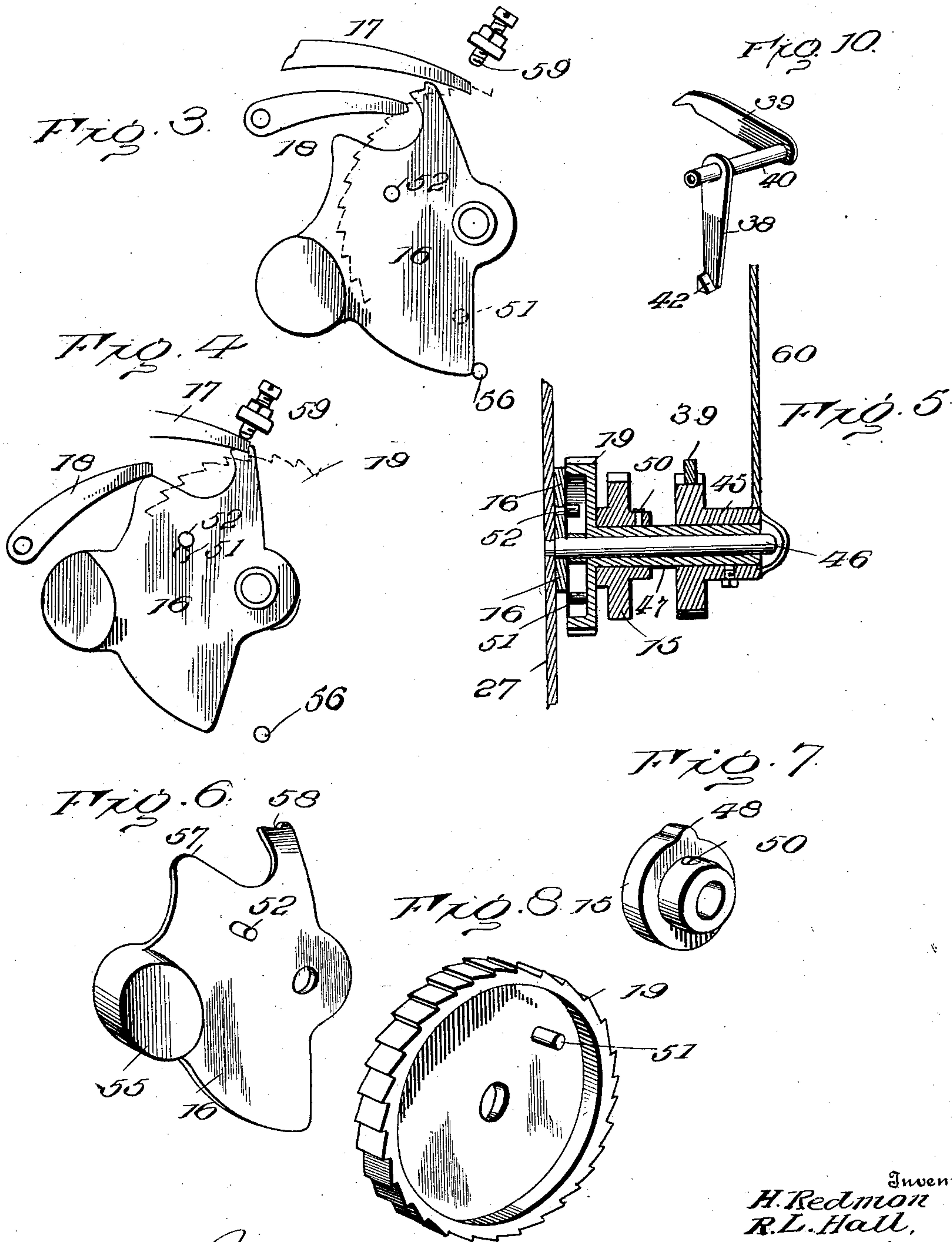
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Witnesses

Wm. L. Thompson

By

R. H. Conway

Inventors

*H. Redmon
R. L. Hall,
R. H. Conway.*

Attorneys

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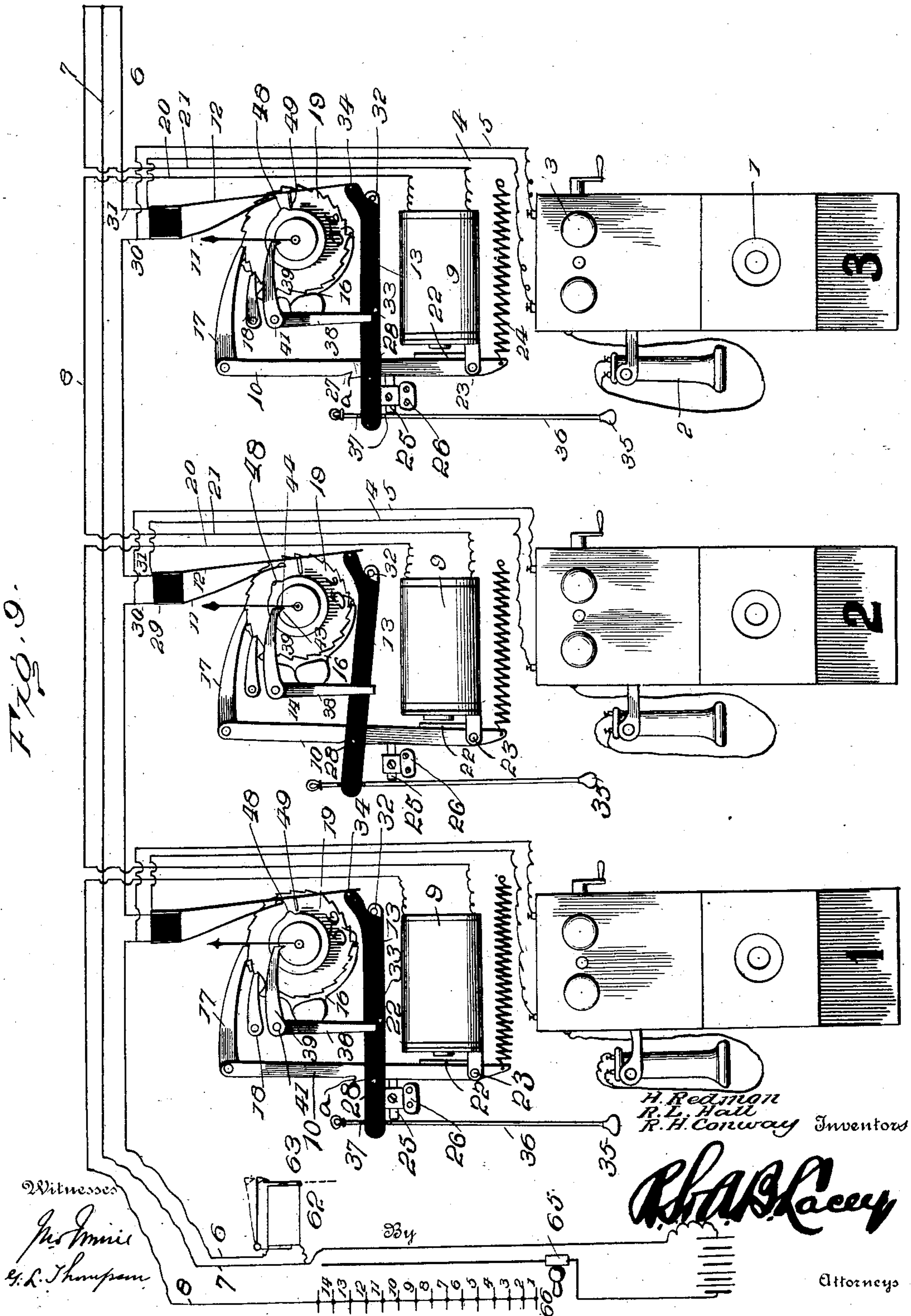
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

HOPE REDMON, RUFUS L. HALL, AND ROBERT H. CONWAY, OF
CYNTHIANA, KENTUCKY.

TELEPHONE SYSTEM.

SPECIFICATION forming part of Letters Patent No. 749,225, dated January 12, 1904.

Application filed November 10, 1902. Serial No. 130,776. (No model.)

To all whom it may concern:

Be it known that we, HOPE REDMON, RUFUS L. HALL, and ROBERT H. CONWAY, citizens of the United States, residing at Cynthiana, in the county of Harrison and State of Kentucky, have invented certain new and useful Improvements in Telephone Systems, of which the following is a specification.

This invention aims to secure privacy in the use of telephones and to prevent interruption of parties using the line by any one on the same circuit.

In accordance with this invention each subscriber of a party-line is provided with an instrument which normally cuts the telephone out of circuit, with a lock mechanism to prevent the use of the telephone when the line is in service, with a releasing device to permit any party using the line when not preoccupied, and with resetting mechanism to restore the instrument and line to a normal position, the instruments being under control from a given point or exchange.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and drawings hereto attached.

While the essential and characteristic features of the invention are susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a front view of an instrument embodying the invention. Fig. 2 is a perspective view thereof, on a larger scale, the dial or front of the case being omitted. Fig. 3 is a detail view of the ratchet-wheel, trip, and pawls coöperating with the ratchet-wheel, showing their normal positions. Fig. 4 is a view of the parts shown in Fig. 3, illustrating their positions when the pawls are tripped to admit of the restoring of the instrument to a normal condition. Fig. 5 is a longitudinal section of the elements mounted upon the shaft carrying the pointer, trip, ratchet-wheel, and switch-actuator. Fig. 6 is a detail perspective view of the trip. Fig. 7 is a detail

perspective view of the switch-actuator. Fig. 8 is a perspective view of the ratchet-wheel as seen from the rear. Fig. 9 is a diagrammatic view. Fig. 10 is a detail perspective view of the lock device.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The telephone for each subscriber may be of any design or make and comprises, essentially, a transmitter 1, receiver 2, and bell 3. The instruments may be included either in a return or ground circuit, the leads being indicated at 4 and 5. The main line, including the telephones, is represented at 6, the return-circuit at 7, and the operating-line at 8, the latter being utilized for controlling the instruments governing the telephones of the several subscribers upon any prescribed party-line.

Each subscriber has installed with the telephone an instrument comprising the following essential elements—namely, an electromagnet 9, actuating-lever 10, short-circuiting switch comprising the contacts 11 and 12, switch-operating lever 13, lock 14 therefor, automatic switch-actuator 15, trip 16, pawls 17 and 18, a ratchet-wheel 19, the pawl 18 being a detent to prevent backward movement of the ratchet-wheel and the pawl 17 serving to advance the ratchet-wheel at each actuation of the lever 10. The several elements are compactly grouped and appropriately housed for protection, and are mounted so as to offer a minimum amount of resistance to the energizing force when the electric circuit is established.

The electromagnet 9 is looped into the circuit by means of the leads 20 and 21, and its armature 22 is pivoted at 23 and carries the actuating-lever 10. A spring 24 coöperates with the lever 10 and armature 22 to normally hold the latter a given distance from the core of the electromagnet, the outward movement of the lever 10 being limited by a stop 25, adjustably held in a bearing 26, affixed to the base or support 27, to which are attached the operating parts of instrument. The actuat-

ing-lever 10 is provided with a shoulder *a* for supporting the outer end of the switch-operating lever 13 when lifted at its outer end, said shoulder receiving a pin or projecting part 28 of the lever 13, as indicated at station 2 in Fig. 9. The operating-pawl 17 is pivoted to the lever 10 and is adapted to engage with the teeth of the ratchet-wheel 19, so as to move the latter forward at each oscillation of the lever 10. The detent 18 likewise co-operates with the teeth of the ratchet-wheel 19 to prevent backward movement thereof when the pawl 17 is returning to a normal position preliminary to again moving forward.

The short-circuiting switch has its contacts 11 and 12 preferably formed of springs which are electrically insulated from each other and from the base 27 by means of the block 29 of insulating material. Leads 30 and 31 electrically connect the contacts 11 and 12 with the line 6 and with the leads 4 and 5. Under normal conditions—that is, when the party-line is not in service—the contacts 11 and 12 are in engagement and short-circuit the line and cut the telephones out, this being indicated most clearly in stations 1 and 3 of Fig. 9. The contact 12 is longer than the contact 11 and is adapted to be acted upon by means of the actuator 15 and the switch-operated lever 13 to separate the contacts 11 and 12 and throw the telephone into circuit, as indicated in station 2 of Fig. 9.

The switch-operating lever 13, preferably of insulating material, is pivoted at 32 and is provided with pins or lateral projections 28, 33, and 34, the latter being adapted to come in contact with the part 12 and open the switch when the outer end of the lever 13 is moved upward, as indicated in station 2 of Fig. 9. The lever 13 is limited in its downward movement preferably by means of the bearing 26 and is adapted to be operated by hand through the instrumentality of the button 35 and rod 36, the latter being slidably mounted in suitable guides and having parts to engage with the lever 13. The push-button 35 is adapted to be pressed upon in a vertical direction when it is required to cut the telephone into circuit and open the short-circuiting switches 11 and 12. As shown, pins 37 project laterally from the rod 36 and embrace the upper and lower edges of the lever 13 and cause the outer end of said lever and the rod 36 to move together.

The lock for securing the switch-operating lever 13 against movement when the line is in use comprises arms 38 and 39, projected from a hub or sleeve 40, mounted upon a shaft 41, projected from the base 27. The arm 38 is vertical, and its lower end is adapted to extend over the pin or projection 33 of the lever 13 and secure the same when the lock is moved to an operative position. The inner beveled extension 42 is adapted to overhang and engage with the pin 33, and when said part 42

comes below the pin 33 the lever 13 is adapted to lower at its outer end by reason of the beveled side of the extension 42 riding upon the pin 33. The arm 39 projects horizontally and terminates in a tooth 43, which is adapted to enter a notch 44 of a collar 45, loosely mounted upon the shaft 46, projected outward from the base 27. A sleeve 47 is mounted on the shaft 46 and carries the ratchet-wheel 19, actuator 15, and collar 45 and causes these parts to move together. Under normal conditions the tooth 43 of the arm 39 enters the notch 44 of the collar and holds the lower end of the arm 38 out of the path of the pin or extension 33, thereby permitting the lever 13 to be operated. Upon actuation of the lever 10 the ratchet-wheel 19 and collar 45 are moved forward a distance to cause the tooth 43 to ride out of the notch 44, thereby oscillating the lock and throwing the lower end of the arm 38 directly in line with the pin or extension 33, thereby preventing movement of the lever 13 and interruption of the line when preoccupied by two or more subscribers.

The actuator 15 consists of a collar having an offstanding portion 48, which is adapted to engage with a pin or extension 49 of the contact 12 and open the short-circuiting switch to cut any selected telephone into circuit, said actuator being controlled from the exchange, central station, or other point in the manner presently to be described. The actuator is secured to the sleeve 47 by means of a clamp-screw 50 and can be adjusted to any position, so as to engage with the contact 12 and open the short-circuiting switch and cut the telephone into circuit at any determinate point in the revolution of said actuator.

The ratchet-wheel 19 is secured to the sleeve 47 in any way, so as to rotate therewith, and may be provided with any number of teeth and is moved forward step by step by means of the pawl 17 at each oscillation of the actuating-lever 10. The rear side of the ratchet-wheel 19 is hollow and is provided with a pin or stop 51 for co-operation with a corresponding pin or stop 52 of the trip 16, so as to operate the latter at the predetermined point in the revolution of the ratchet-wheel to trip the pawls 17 and 18 and admit of restoration of the instrument to a normal position, whereby any subscriber may use the line. Any means may be resorted to for resetting or restoring the instrument to a normal position and, as shown, a spring 53 is connected at its free end by means of a cord 54 with the sleeve 47, said cord winding upon the sleeve as the latter turns with the ratchet-wheel 19. When the ratchet-wheel is released from the pawls 17 and 18, the spring 53, regaining itself, returns the parts to a normal position, the tooth 43 entering the notch 44 and limiting the backward movement of the ratchet-wheel and parts connected therewith during the operation of resetting the instrument.

The trip 16 is loosely mounted upon the shaft 46 and is counterbalanced in any way, being preferably weighted, as shown at 55. The trip 16 is limited in its downward movement at its free end by means of a pin or stop 56, projected from the base 27, and is provided with shoulders 57 and 58 of greater radius than the ratchet-wheel 19 and normally out of the path of the pawls 17 and 18. When the ratchet-wheel 19 reaches the predetermined point in its revolution to effect a resetting of the instrument, the stop 51 engages with the stop 52 and turns the trip 16, so as to bring the shoulders 58 in the path of the pawl 17, whereby the succeeding movement of the actuating-lever 10 causes the pawl 17 to move the trip 16 forward, and the shoulders 57 and 58 coming in contact with the pawls 17 and 18 lift the same clear of the teeth of the ratchet-wheel, thereby permitting the resetting of the parts by operation of the restoring means, which in the present instance is the spring 53 and cord 54. The instant the lever 10 is relieved of the influence of the electromagnet it returns to a normal position, and the trip being released from the pawl 17 returns to a normal position. The forward movement of the lever 10 and pawl 17 is limited by means of an adjustable stop 59.

If preferred, each instrument may be provided with indicating means to show when the line is in use and by which subscribers. For this purpose a pointer or hand 60 is connected with or applied to the collar 45, so as to turn therewith, said pointer co-operating with graduations of a dial 61, applied to or forming a part of the front of the case inclosing the working parts. The indicating mechanism may be omitted or concealed, if desired, so that the subscribers may not ascertain by whom the line is preoccupied. The exchange, central, or controlling station must be equipped with indicating mechanism to enable the operator to select any subscriber of the line with whom another subscriber or party desires to communicate.

At the left hand of Fig. 9 is indicated mechanism to enable the operator to select any subscriber of the line to the exclusion of the remaining subscribers, said mechanism comprising an indicator 62 63, battery 64, and switch comprising a movable contact 65 and a plurality of electric contacts 66. As the contact 65 is moved over the contacts 66 in successive order, impulses are sent over the lines 7 and 8 and correspondingly energizes the electromagnets 9, whereby their armatures and the levers 10 are actuated and correspondingly move the ratchet-wheels 19. At each impulse the ratchet-wheels of all the instruments in circuit are correspondingly moved, and inasmuch as the actuators 15 are differently positioned, the first to open the short-circuiting switch at one impulse, the second

to open said switch at two impulses, the third at three impulses, and so on, it will be readily understood that the operator can select any instrument by moving the contact 65 to one of the series of contacts 66 representing the station or subscriber to be selected. It must be remembered that a single oscillation of the levers 10 moves the ratchet-wheel and operates the locks, so as to prevent any subscriber from operating the lever 13 until the instruments have been restored to a normal position after having been once actuated. If subscriber No. 1 is the one desired, the operator moves the contact 65 to the first contact of the series 66, thereby bringing the projection 48 of the actuator 15 opposite the projection 49 of the contact 12, and opening the switch and cutting the telephone of subscriber No. 1 into circuit. Should subscriber No. 3 be the one desired, the operator moves the contact 65 to the third contact of the series 66, thereby cutting subscribers 1 and 2 out of circuit and subscriber No. 3 into circuit. At the first operation of lever 10 subscriber No. 1 is cut into circuit. At the second operation of lever 10 subscriber No. 1 is cut out of circuit and subscriber No. 2 cut into circuit; but as the impulses are sent over the line by a movement of contact 65 over the series of contacts 66 are cut successively out of circuit until the selected subscriber has been reached, all the other telephones being cut out of circuit with the exception of those selected.

When a subscriber desires to communicate with any other subscriber, the button 35 is pressed upon, thereby opening the switch and cutting the telephone into circuit, and the central being signaled and informed as to the desired party with which communication is desired said party is selected by means of the operator at the exchange by movement of the contact 65 in the manner stated, the party first calling up central holding the button 35 in order to prevent cutting his telephone out of circuit and locking the same against operation until restored to normal position by the operator at the exchange. After the subscriber first calling central has been placed in communication with the party desired the line cannot be used by any other subscriber, and the parties using the line cannot be interrupted. When the parties using the line are through, central is rung and the line restored to normal condition by passing the contact 65 over the series of contacts 66 to the last, when all the instruments will be reset by the trips 16 disengaging the pawls 17 and 18 from the teeth of the ratchet-wheel 19 in the manner stated.

Having thus described the invention, what is claimed as new is—

1. In a telephone system, a short-circuiting switch for normally cutting the instruments of a party-line out of circuit, a switch-operating lever moved by hand, an electric actuating-

lever, co-operating means between the said le-
vers for locking the switch-lever when moved
to open the switch, means for locking the
switch-operating levers of the remaining in-
5 struments and under control of the operator
at central or exchange, an actuator for throw-
ing the selected instrument into circuit, and
a resetting mechanism for restoring all the
instruments to normal condition, substantially
10 as specified.

2. In a telephone system, short-circuiting
switches for normally cutting the instruments
out of circuit, a switch-operating lever for en-
abling any subscriber to cut the telephone into
15 circuit with exchange or central, a toothed
wheel, a pawl co-operating therewith, an ac-
tuating-lever carrying said pawl, an actuator
movable with the toothed wheel, a lock for the
switch-operating lever, a notched collar for
20 said lock concentric with the actuator and
toothed wheel and movable therewith, lock-
ing means between the said switch and actu-
ating-levers, and means for releasing the in-
struments when the parties are through with
25 the line to enable any subscriber cutting the

telephone into circuit, substantially as de-
scribed.

3. In combination, a telephone, a short-cir-
cuiting switch for normally cutting the tele- 30
phone out of circuit, a lever adapted to be op-
erated by hand for throwing the switch to cut
the telephone out of circuit, a lock for said le-
ver, a toothed wheel, an actuating-lever there-
for, a pawl connected with the actuating-lever,
a switch-actuator connected with the said 35
toothed wheel, a collar connected with said
toothed wheel and actuator and adapted to op-
erate the aforementioned lock, a resetting
mechanism, and a trip for effecting a release
40 of the toothed wheel to admit of automatic
restoration of the parts, substantially as set
forth.

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

HOPE REDMON. [L. S.]

RUFUS L. HALL. [L. S.]

ROBERT H. CONWAY. [L. S.]

Witnesses:

PIERRE CURLE,

C. H. CHANDLER.