

No. 886,909.

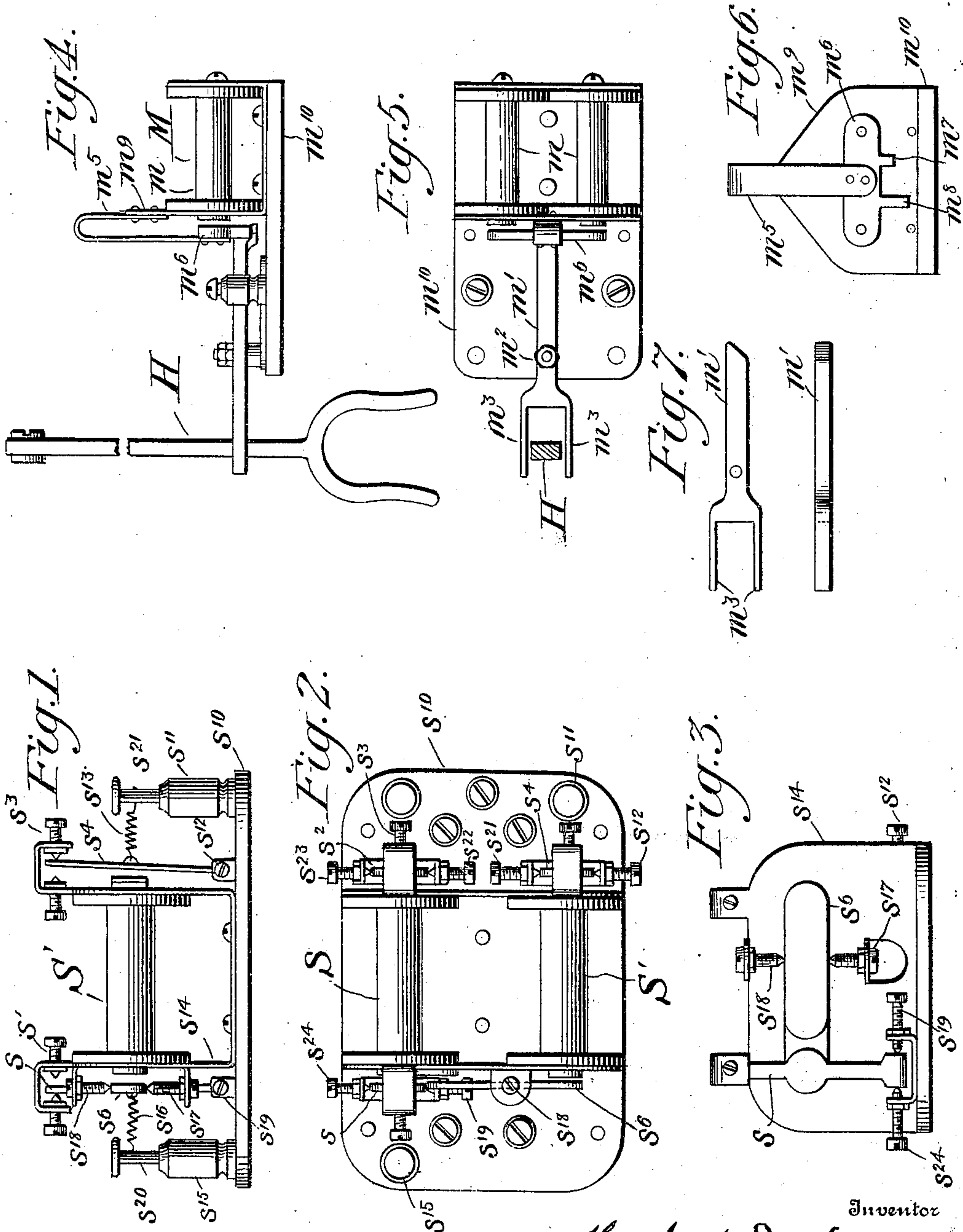
PATENTED MAY 5, 1908.

H. D. WILLIAMS.

PARTY LINE TELEPHONE SELECTOR AND LOCK OUT.

APPLICATION FILED JUNE 19, 1906.

2 SHEETS—SHEET 1.



Witnesses

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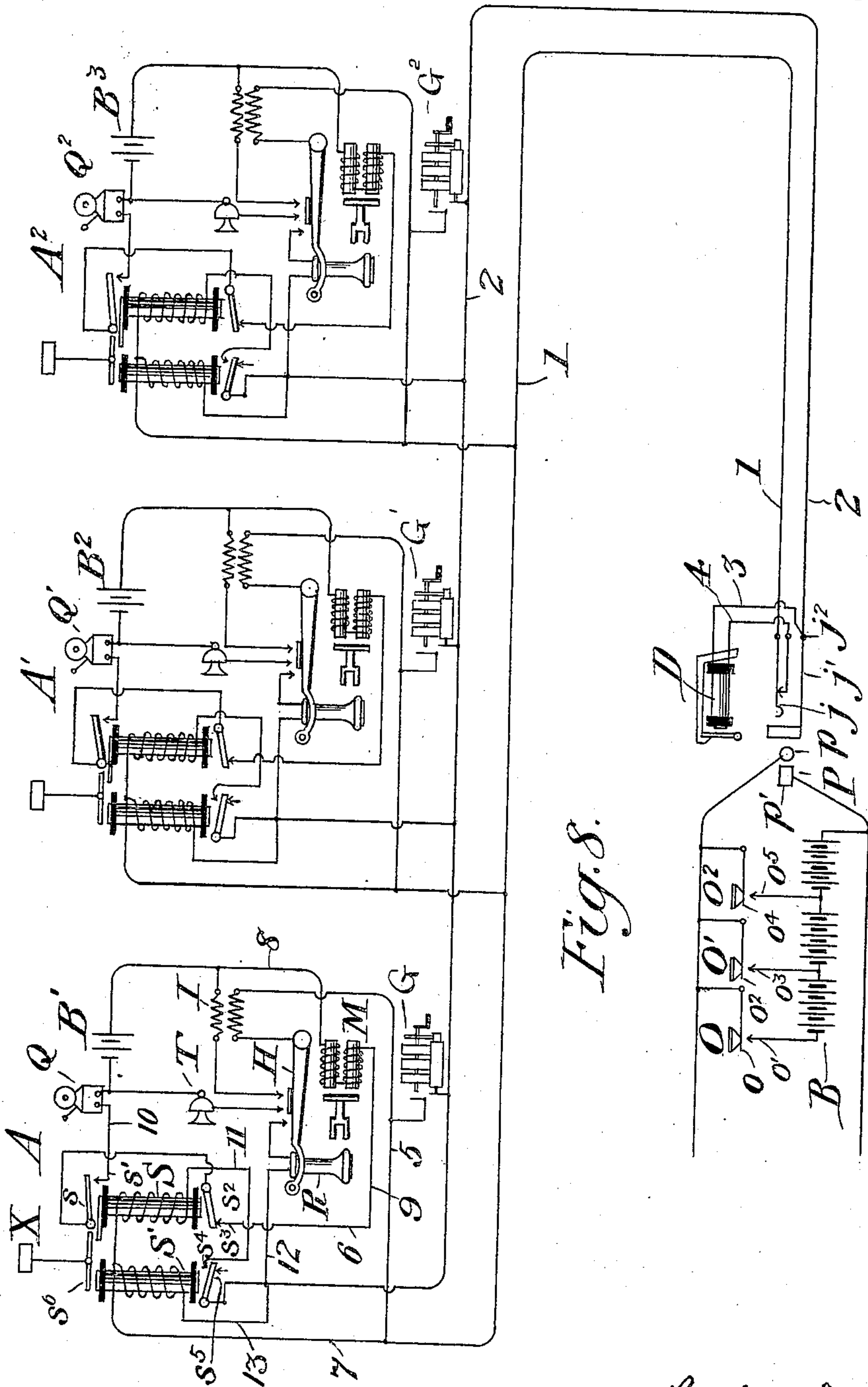


Fig. 8.

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UNITED STATES PATENT OFFICE.

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PARTY-LINE TELEPHONE SELECTOR AND LOCK-OUT.

No. 886,909.

Specification of Letters Patent.

Patented May 5, 1908.

Application filed June 19, 1906. Serial No. 322,467.

To all whom it may concern:

Be it known that I, HERBERT D. WILLIAMS, a citizen of the United States, residing at Vermillion, in the county of Marshall and State of Kansas, have invented certain new and useful Improvements in Party-Line Telephone Selectors and Lock-Outs, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to telephone exchange systems, and particularly to that class known as party line, lock-out systems, and has for its object the simplifying of the apparatus, both at central and at the subscriber's station. In a great many of these systems, step by step movements are used, necessitating the use of complicated mechanism, both at the subscriber's station and at central. In still other systems polarized relays, complicated circuits or series arrangements are employed. It is my intention to obviate all these complications by employing simple selecting relays at the subscribers' stations, which are operated from central by buttons or keys, similar to those employed in party line ringing outfits. When a certain button is depressed at central, current of a certain strength or voltage is sent out over the line, to operate the relay of the wanted station. When such a relay is operated, it closes the circuit of a simple locking device in the telephone, which unlocks the receiver hook, allowing the talking circuits to be closed when the receiver is removed. The receiver hooks at all the other stations on the same line remain locked, and it of course follows that the subscribers at these stations are unable to listen in.

Specifically stated, my invention consists of the method of sending currents of different voltages over the line, operating the relays of the various stations successively until that of the desired station is reached. These relays are provided with two armatures, one of which, operates and signals the party on receiving just the right amount of current. The other armature when operated, opens the signal circuit when a current in excess to that required to operate the first armature is sent, so it follows that in selecting a station whose relay requires a certain E. M. F., say 30 volts, the preceding telephones whose relays only require 10 and 20 volts respectively to be operated, will have both armatures attracted, disconnecting the signaling

circuits in these stations. The stations following the stations selected, whose relays require a voltage of greater strength to be operated, are not affected to a greater extent than to operate the busy signal, so as to show that the line is engaged. At the end of the conversation, the busy signal is restored by the subscriber turning his hand generator when through talking. My system composed of the foregoing elements, allows me to employ a selective system, having an unlimited number of telephones on the same line, and allowing any telephone to be selected, locking out all others. I am able to accomplish all this without the use of complicated mechanism, or grounds at the subscribers' stations.

My invention is illustrated in the accompanying drawings, wherein

Figure 1 shows a side view of my selective relay. Figs. 2 and 3 show respectively a top and end view of the same relay. Fig. 4 shows a side view of the locking device engaging a receiver hook. Figs. 5 and 6 respectively show a top and end view of the locking device. Fig. 7 is a detail of the fork which engages and locks the receiver hook. Fig. 8 is a circuit showing three subscribers' stations terminating in a central office, and means therein for selecting any one of the three stations.

I will first give a description of the mechanical figures comprising a selecting relay and lock-out device, and afterwards a description of the circuits and the operation of same.

Referring now to Figs. 1, 2, and 3, the two coils S and S' are mounted on the base s^{10} , by means of the supports or braces s^{14} . This frame is formed so that the extensions hold the contact points s' , s^3 , &c., and also support the pivot points s^{18} , s^{17} , &c. The coil S has the two armatures s and s^2 opposite either pole. The armature s is adjusted so that it only operates, that is to say attracted by the core, when a current of certain strength is placed on the line from the central office. The armature s^2 is attracted when excess current is placed on the line. This last armature when attracted opens the signaling circuit in the telephone, while the first armature s closes the circuit.

The coil S' which also responds to alternating current directly operates the armature s^4 . The armature s^6 is operated by either coil as it is balanced midway between

the two coils by the pivot points s^{18} and s^{17} . This armature controls the busy signal X, shown in Fig. 8. The armature s^4 when attracted, closes the circuit of the coil S.

Fig. 3 shows exactly how the armature s^6 is balanced on the pivot points s^{18} and s^{17} , about midway between the two coils S and S'. In the same figure the methods of mounting the armatures, s , s^4 , and s^2 , are shown. The various armatures can be readily adjusted to operate on any desired current by simply regulating the thumb screws, s^{20} and s^{21} , &c., which changes the tension of the springs, s^{16} , s^{14} , &c.

Referring now to Figs. 4, 5, 6 and 7 the locking device M consists of two coils m , supported on the frame m^9 , which in turn is fastened to the base m^{11} by means of suitable screws plainly shown in the drawing. A U shaped spring or support m^5 , is fastened directly to the frame m^1 by means of small rivets or screws. This U shaped spring contains or supports the armature m^6 . This armature extends across the cores of the two coils as plainly shown in Fig. 5.

Fig. 6 shows the form of the armature m^6 with the two projections m^8 and m^7 . These two projections engage the fork m' . This fork is supported and pivoted to the base by the post m^2 . The prongs m^3 of the fork engage the hook H, and hold it locked when the armature m^6 is in its normal position, as shown in the drawings. When this armature is attracted, the end of the fork is freed from the projections m^8 and m^7 , and by removing the receiver, the hook H under the action of a suitable tension spring, causes the fork m' to swing or rotate on the pivot support m^2 . When the hook is restored to its normal position, upon hanging up the receiver, the end of the fork snaps in place between the two projections m^8 and m^7 , and locks itself, thus preventing any movement of the receiver hook H, until proper current is sent from central energizing the coils m of the locking device.

Referring to Fig. 8, the subscriber's station A, consists of apparatus usual in local battery systems, consisting of receiver R, hook H, transmitter T, induction coil I, battery B', and generator G. In place of the usual ringer, which operates upon alternating current, I have substituted an ordinary vibrating bell Q, which operates directly from battery at the subscriber's station. In addition to the foregoing apparatus, I have added a locking device M, which is in series with the ringer Q, and battery B'. I have also added the selecting relay containing the two coils S and S'. These two coils jointly operate the busy signal X, throwing it in to either busy or idle position. The coil S' is bridged directly across the line wires 1 and 2, and when energized, attracts its armature, connecting the

coil S directly across the line wires 1 and 2. When the armature s of the relay S operates upon a suitable current from central, it closes the circuit ringer Q, and locking device M in series, ringing the bell and unlocking the receiver hook. If voltage in excess to that necessary to operate the signal circuit is sent out, the armature s^2 is operated, opening the circuit of the bell and locking device, rendering them inoperative. The armature s of the coil S at the various stations is adjusted so as to be operated on a certain voltage, that is to say, this armature s at station A, is adjusted to operate upon ten volts; the armature at station A', to operate upon 20 volts; the armature at station A², to operate upon 30 volts, and so on. The armatures s^2 at the various stations become operative upon voltage in excess to that required to operate the armatures s .

The line wires 1 and 2 terminate in the central office on a line drop D, through the normally closed contacts of the jack J. The operator's calling device terminates a plug P. This calling device consists of a series of push buttons, which connect battery of the desired voltage across the tip and sleeve of the plug, and from there to the line to the subscriber's station.

The operator desiring to call station A, would depress the button O^2 , connecting battery of the required voltage to operate or call this particular station. This battery does not have to be of any particular voltage.

I simply use the number 10, 20 and 30 for convenience. The selecting relay can be adjusted so as to respond to any voltage that may be required.

In the various figures, like letters or characters are used to designate like parts, and as the apparatus in the various stations is identical, it is only necessary to letter those of one station.

The operation of my system, is as follows: The operator desiring to call a certain station, say for example, station A, inserts the plug P into the jack J, disconnecting the line drop D. As soon as this connection is made, she depresses the button O^2 , which connects the battery of the required voltage to operate or call station A. Current flowing through the wires 1 and 2 passes through the normally connected coil S'. This coil is responsive to the current of any voltage, and becoming energized attracts its armature closing the contacts s^4 and s^5 connecting the coil S to line. As the proper current has been sent to call the station A, the armature s becomes attracted, closing the circuit of the bell Q, and the locking device M, in series with battery B'. The locking device M operating unlocks the hook H and the bell Q ringing notifies the subscriber that he is wanted. Upon coming to the telephone and removing his receiver, he is enabled to con-

verse, as his hook is operative. The coils S' at the various stations on the same line, became energized when the operator depressed the button O². These coils close the circuit of their respective coils S, but current of the voltage required to operate them is not furnished, and they therefore remain inactive. As long as these coils remain inactive, the locking devices are not operated, and the receiver hooks remain locked, preventing the subscribers at any but the called station, from listening in on the line. While not enough current flows through the various coils S upon the closing of their circuits by the relay S', to attract their armatures s and s², there is enough current to operate the balanced armature s⁶. The operating of this armature s⁶ throws the targets X into a busy position. This target can be of any desired type, showing red when busy, and white when idle. At the end of the conversation, the subscriber at station A turns his hand generator G, so as to notify the operator at central that he has finished conversing. Besides notifying the operator, he also notifies the subscribers on the same line, that the line is idle in the following manner: The coils S' being bridged permanently across the line wires 1 and 2, respond to current from this generator, and operate the armatures s⁶, throwing the target or busy signal into an idle position. The operator at central, desiring to call No. 2 station or A', depresses button O', connecting current of proper voltage to call station A', the operation of which is identical to that already described, in calling station A. This current which is of sufficient voltage to operate the armature s of the coil S in station A', operates both armatures s and s² in station A, because current in excess to that required to operate the armatures s in station A has been supplied. The armature s² in station A' being operated disconnects the locking device M and bell Q. If station A² were called, the armature s of that station would be operated while the armatures s and s² of both stations A and A' would be operated. From this it can be plainly seen, that an unlimited number of telephones can be placed on one line, and any one of the same can be selected, and the other stations rendered inactive, or cut out. The subscriber desiring to call central, turns his hand generator a number of times, corresponding to his number, that is to say, subscriber at #3 station desiring to make a call would turn his hand generator three times notifying the operator at central, that #3 station was calling. The operator then pushes the button corresponding to his number, thereby operating the locking device and releasing his switch hook.

It will be noticed that none of the parties on the line excepting the selected party can listen, on account of the circuit of the re-

ceiver being kept open when the hook is in its locked position.

From the foregoing description it will be seen, that my invention provides for a very simple and efficient party line system, employing the much desired lock-out feature preventing listening in and thus securing privacy at all times.

Having thus described my invention what I claim and desire to secure by Letters Patent is:

1. In a telephone system, the combination with a central office and a plurality of subscribers' stations comprising local signal and talking circuits, a switch for controlling each talking circuit, means for locking said switch in inoperative position, means for impressing currents of different intensities upon the line, means responsive to current of certain intensity for releasing the locking means, and means controlling said responsive means and the signal circuit.

2. In a telephone system, the combination with a central office and a plurality of subscribers' stations comprising local alarm and talking circuits with a local source of current, means at each subscriber's station for controlling the local talking circuit, means for controlling the alarm circuit, and means for impressing current upon the line of certain intensity whereby the aforesaid means are operated to complete the alarm circuit and the circuit of the talking circuit controlling means.

3. In a telephone system, the combination with a central station and a plurality of subscribers' stations comprising local alarm and talking circuits with a local source of current for both, means for controlling the talking circuit at each subscriber's station, means for holding said controlling means inoperative, means responding to current of a predetermined intensity for releasing said holding means, means for controlling the alarm circuit, said means controlling the circuit of the talking circuit controlling means, and means for impressing current of different intensities upon the line affecting the substations.

4. In a telephone system, the combination with a central station, and a plurality of subscribers' stations connected thereto, of means at the subscribers' stations for controlling the local talking circuit thereat, means for holding said controlling means in inoperative position, means at the central office for impressing currents of different intensities upon the line, means at the subscribers' stations responding to currents of any intensity, means at each subscriber's station responding only to currents of a certain intensity and controlled by said last named means, said means releasing said holding means.

5. In a telephone system, the combination with a central station and a plurality of subscribers' stations, of means at the central

station for impressing currents of different intensities upon the line, means at the subscribers' stations controlling the local talking circuit thereat, means for holding said controlling means in inoperative position, means for releasing said holding means which is responsive only to current of a certain intensity, and means controlled by said last named means and acting upon an excess of current to render said releasing means inoperative.

6. In a telephone system, the combination with a central station, and a plurality of subscribers' stations having local talking circuits, means for controlling the local talking circuit, means for locking said controlling means in inoperative position, a relay bridged across the line, a magnet at each substation responding to currents of a particular intensity and controlled by said relay to release said controlling means, and means controlled by an excess of current for breaking the circuit of said magnet.

7. In a telephone system, the combination with a central station and a plurality of subscribers' stations having local talking circuits, means for controlling the local talking circuits, and means for locking said controlling means in inoperative position, a relay bridged across the line, a magnet at each substation responding to current of a particular

intensity and controlled by said relay to release said controlling means, means controlled by an excess of current for breaking the circuit of said magnet, and a busy signal operated by the said magnet.

8. In a telephone system, the combination with a central station, and a plurality of subscribers' stations having local talking circuits, means for controlling the local talking circuits, a magnet for locking said controlling means in inoperative position, a relay bridged across the line, means at each substation responding to currents of different intensities and controlled by said relay for operating said magnet to release said controlling means, means controlled by an excess of current for breaking the circuit of said magnet, a busy signal operated by the means which responds to different intensities, and means in series with said relay for returning the busy signal to normal after the local talking circuit controlling means has been reset in inoperative position.

In testimony whereof I affix my signature in presence of two witnesses.

HERBERT D. WILLIAMS.

Witnesses:

CHAS. SCHAFER,
JOHN CANNON.