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Patented Aug. 15, 1911.

7 SHEETS-SHEET 1.

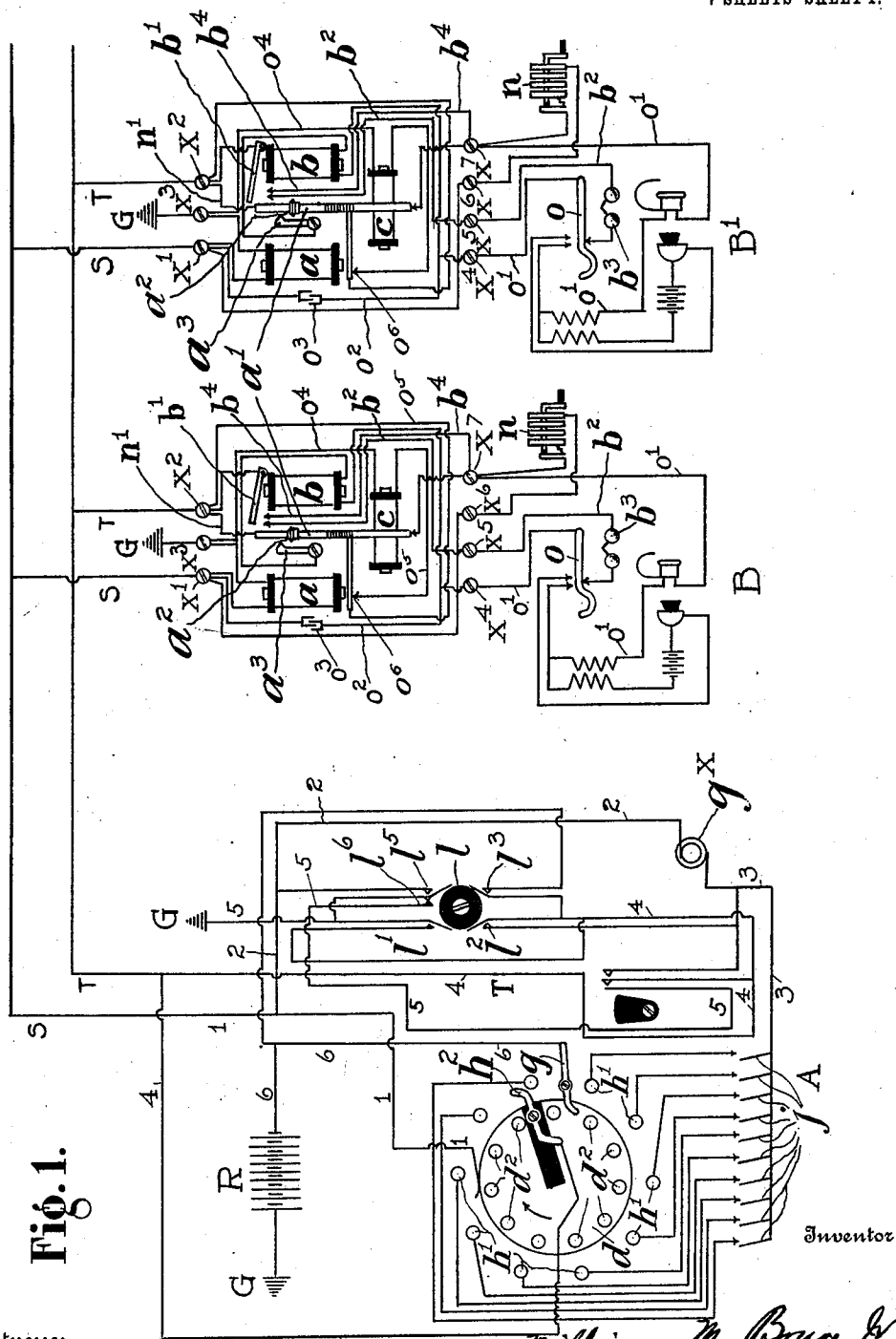


Fig. 1.

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PARTY LINE TELEPHONE SYSTEM.
APPLICATION FILED AUG. 16, 1907.

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7 SHEETS—SHEET 2.

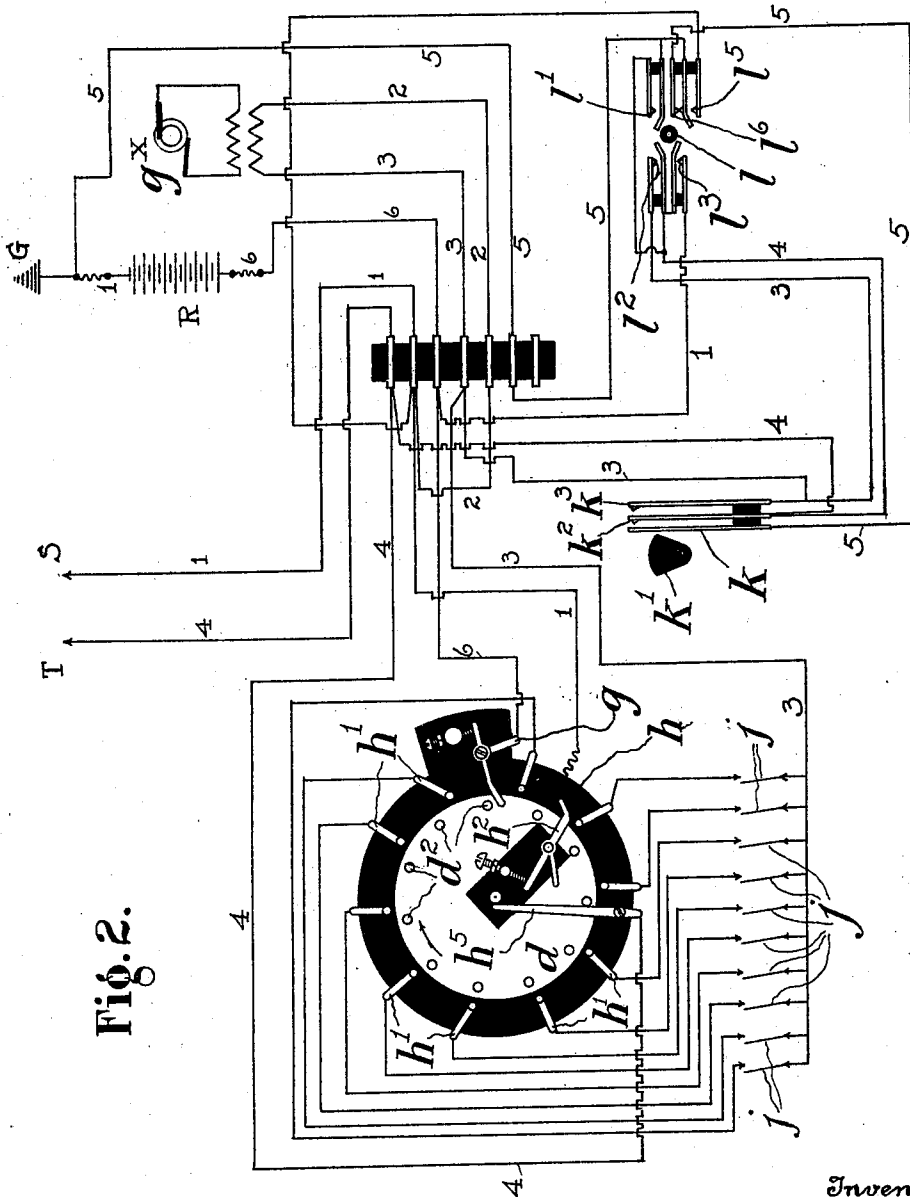


Fig. 2.

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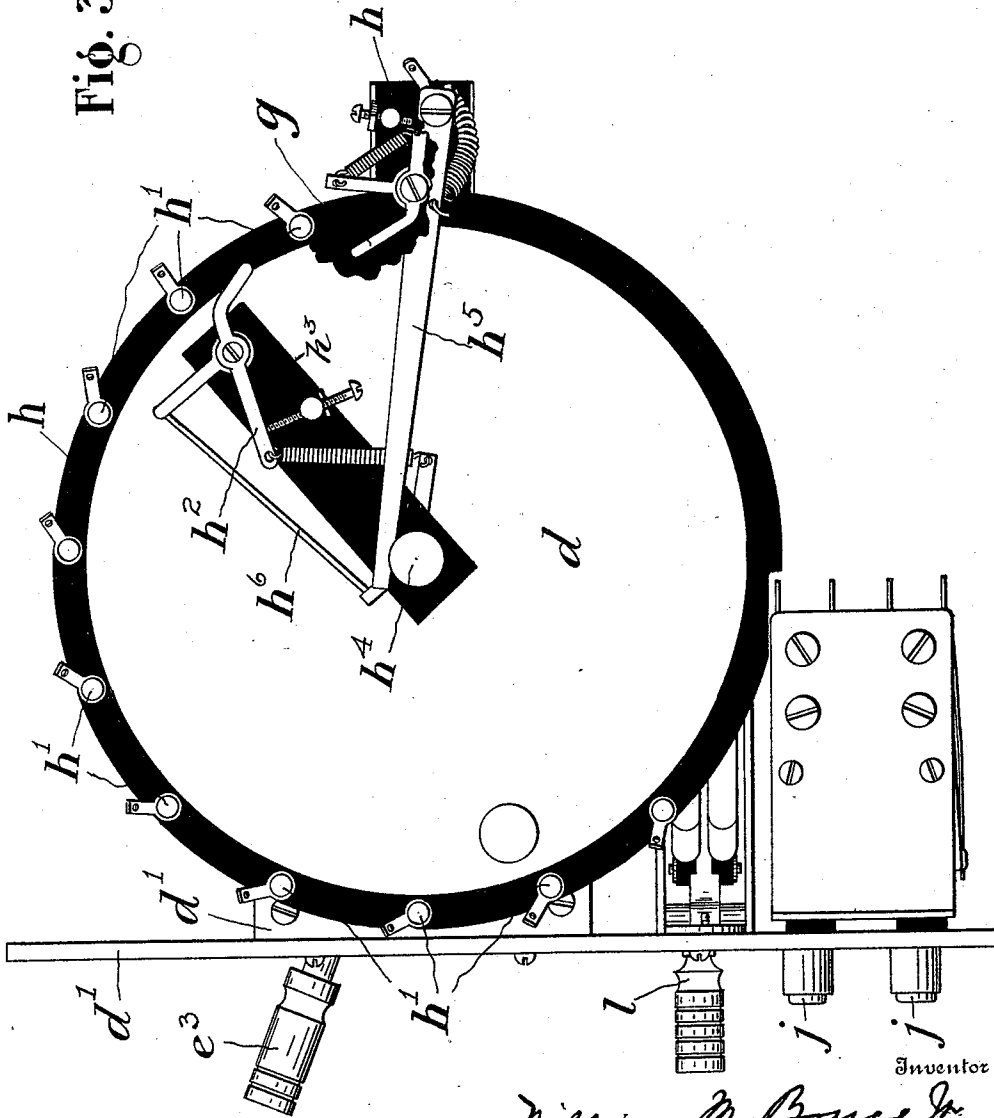
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Fig. 3.



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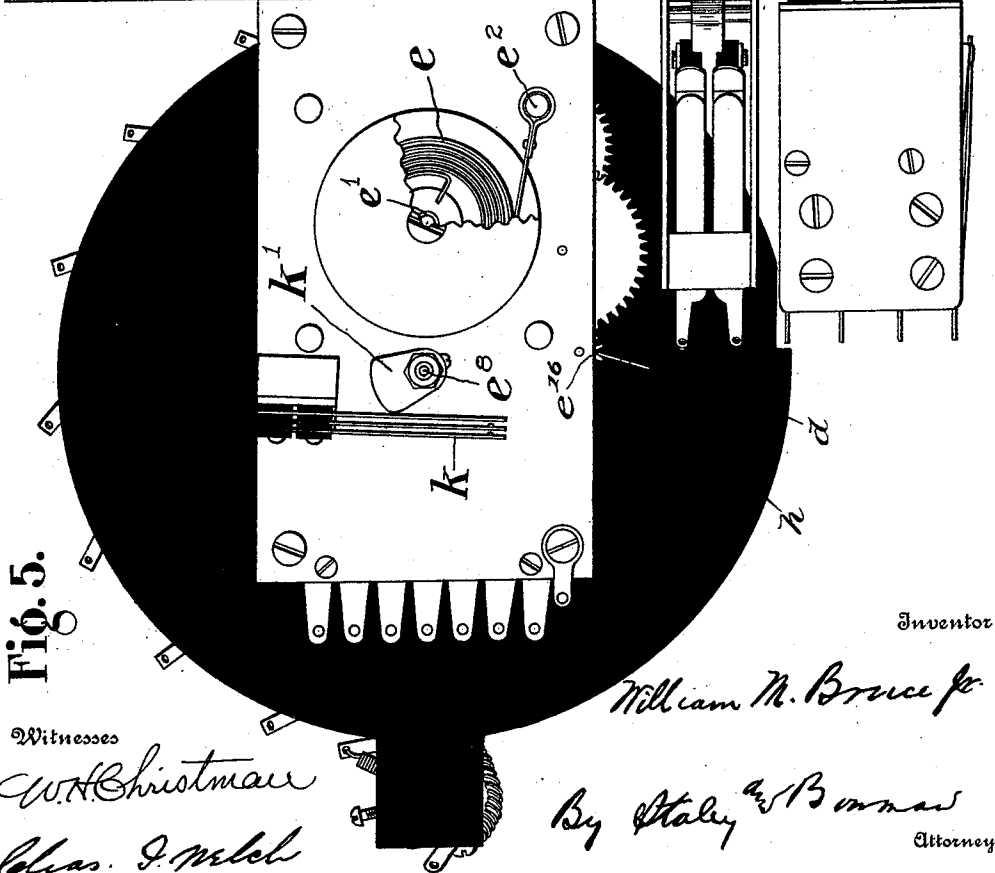
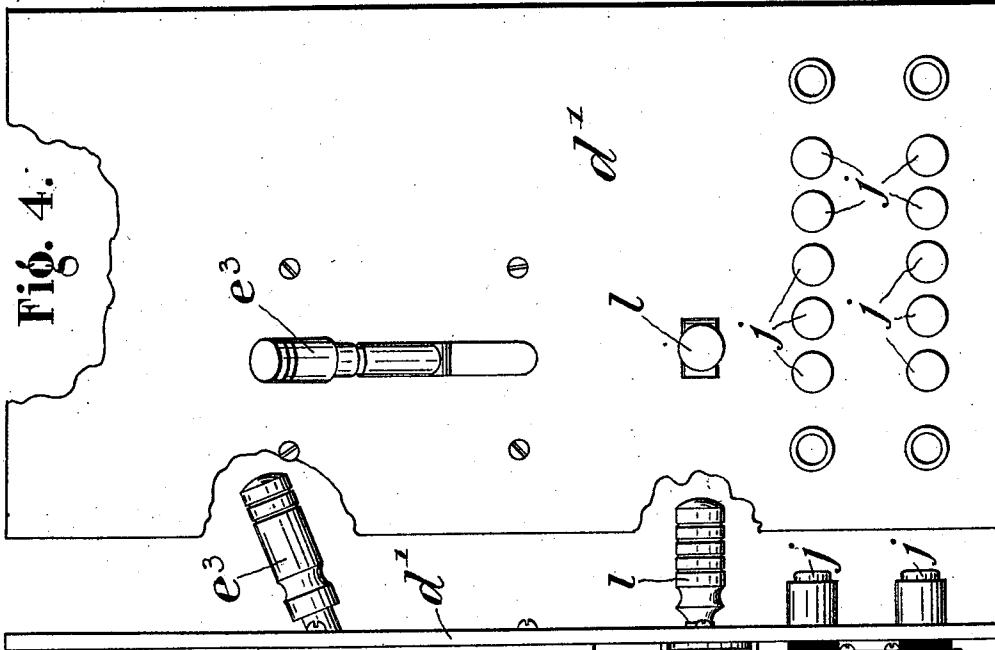


Fig. 5.

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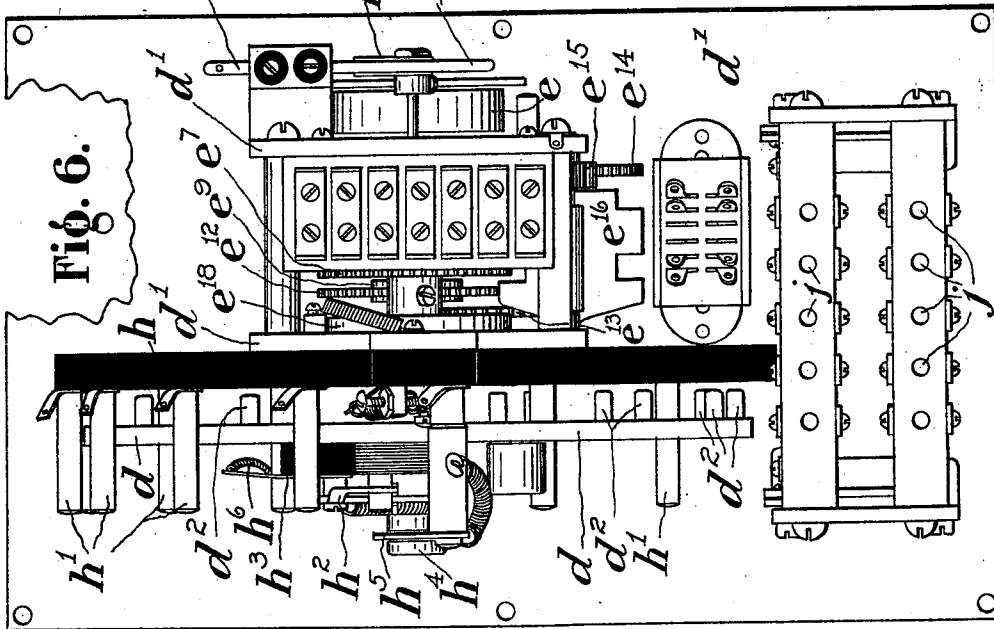
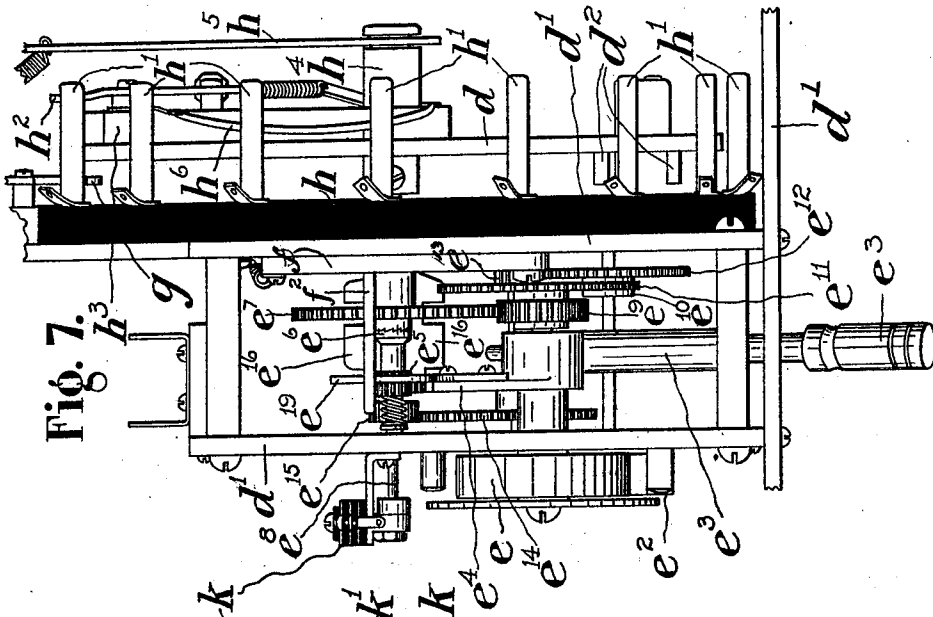
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7 SHEETS—SHEET 6.



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Patented Aug. 15, 1911.

7 SHEETS—SHEET 7.

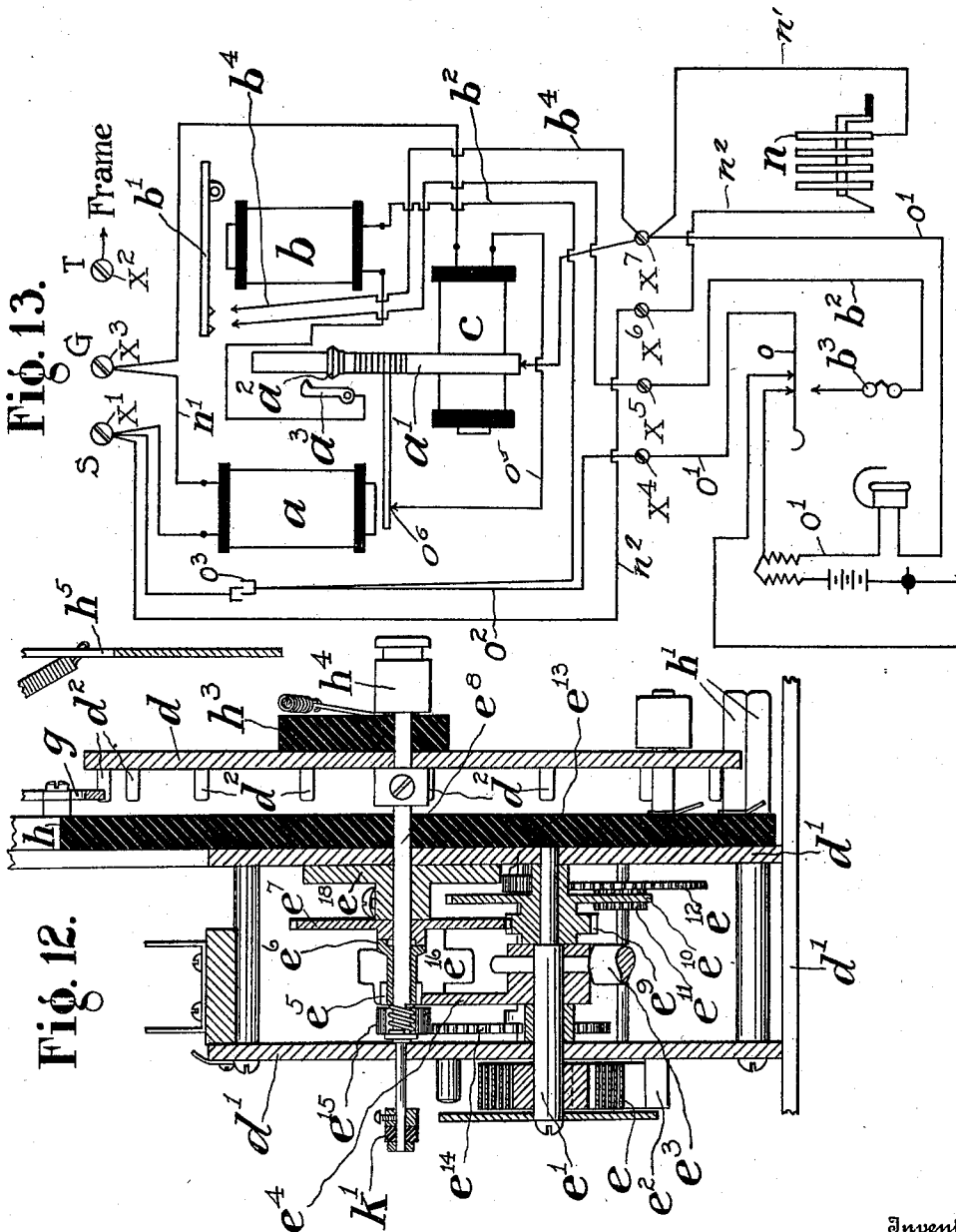


Fig. 13.

Fig. 12.

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UNITED STATES PATENT OFFICE.

WILLIAM M. BRUCE, JR., OF SPRINGFIELD, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS,
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A CORPORATION OF NEW YORK.

PARTY-LINE TELEPHONE SYSTEM.

1,000,488.

Specification of Letters Patent. Patented Aug. 15, 1911.

Application filed August 16, 1907. Serial No. 388,876.

To all whom it may concern:

Be it known that I, WILLIAM M. BRUCE, Jr., a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Party-Line Telephone Systems, of which the following is a specification.

My invention relates to improvements in party-line telephone systems.

The object of the invention is to provide a system and apparatus by means of which any one of a series of individual parties on a common line may be readily signaled from the central station without signaling the other parties on the line, and when connection is made with one party to prevent access to the line or the use of the line by any of the other parties.

The invention has for its further object the simplifying of the apparatus at the central exchange for signaling and communicating with the parties on the line and for facilitating the ready connection and disconnection of the parties, as desired, and, further, to place the line under the control of the operator at the central station.

I attain these and other objects which will appear from the specification and claims by the use of the system and apparatus set forth in the accompanying drawings, in which—

Figure 1 is a diagrammatic view of a party line having two subscribers' stations and a central station connected thereto. Fig. 2 is a diagrammatic view of the central exchange connections and apparatus on a larger scale. Fig. 3 is a side view of the signaling and selecting device at the central station. Fig. 4 is a front view, and Fig. 5 is a side view of the same, Fig. 5 being taken from the opposite side from Fig. 3. Fig. 6 is a rear elevation, and Fig. 7 is a bottom plan view of the same. Fig. 8 is a sectional elevation of the exchange device. Figs. 9, 10 and 11 are details of portions of the same. Fig. 12 is a sectional view of the exchange device. Fig. 13 is an enlarged diagrammatic view of one of the sub-stations.

Like parts are indicated by similar char-

acters of reference throughout the several views.

The general arrangement of the circuits as employed in my system is shown in Fig. 1, in which A represents the central station, B and B¹ two stations on the line, the respective sides of the line being represented by S and T, which letters of reference are intended to indicate what is known as the "sleeve-and-tip" side of the line, the side, S, being connected to the sleeve of the switch-board jack, and the line, T, being connected to the tip of the same at the central station. The signaling and connecting of a given subscriber on the line is effected through the medium of a step-up device operated by a step-up magnet, *a*, which controls a step-up rod, *a*¹, having a projection, *a*², adapted to make an electrical connection with the contacting device *a*³, at a predetermined interval in the step-up movement of the rod. The devices at the different stations are alike, except that the projection, *a*², at each station occupies a different position on the rod, *a*¹, the several projections in the apparatus at the different stations corresponding to a given step in the movement of the rod. The step-up mechanism of each device is operated simultaneously, but only one of them makes electrical connection with the contact, *a*³, on any given step, and if there are as many stations on the line as there are steps on the rod then one of these devices will make contact at each step.

The connection of a given station with the line to the exclusion of the other stations is effected through the medium of a selector magnet, *b*, which by the means and methods hereinafter set forth is supplied with current from the central station during the electrical connection between the parts, *a*² *a*³; it being understood that this electrical connection is maintained only during the interval between the steps of the rod, *a*¹.

Means (not shown in the drawings) are provided for holding the rod from backward movement as it is being stepped-up, and also for maintaining the electrical connection which is established by the selector

magnet, *b*, and these means are operated to release the rod and the magnet and thus permit the parts to be restored to normal position by a releasing magnet, *c*. The exact mechanism for this forms no part of the present application and is described and set forth in other applications and need not be considered here, the magnets and their connections being here set forth only for the purpose of illustrating the circuits and the relation they occupy to the system and apparatus employed at the central station.

The mechanism employed at the central station embodies a rotating part having a series of contacts adapted to make electrical connection with a yielding though normally stationary contacting device, there being as many of the electrical connections on the rotating part as there are stations, or as there are steps on the step-up rods. This rotating part also carries a second electrical connection, preferably pivoted or yielding, adapted to make connections with a series of stationary contacts, there being as many of these stationary contacts as there are stations or steps on the step-up rods. I have shown this revolving part in its preferable form and as consisting of a disk, *d*, mounted in a suitable frame, *d*¹, and adapted to be operated by a clock-work or spring-motor consisting preferably of a main motor spring, *e*, which is connected at one end to a shaft, *e*¹, and at the other to a stationary stud, *e*², on the frame, *d*¹. The shaft, *e*¹, has secured thereto an operating handle, *e*³, and a gear segment, *e*⁴. The gear segment meshes with the pinion, *e*⁵, which is connected by a ratchet clutch, *e*⁶, to a gear, *e*⁷, which is mounted on the shaft, *e*¹, that carries the rotating disk, *d*. The gear, *e*⁷, meshes with the pinion, *e*⁹, which is formed integral with or connected to the gear, *e*¹⁰, this pinion and gear running loosely on the shaft, *e*¹. From this gear, *e*¹⁰, connection is made through suitable gearing, *e*¹¹, *e*¹², *e*¹³, *e*¹⁴ and *e*¹⁵, to a fan wheel, *e*¹⁶, by which the motion of the disk when being operated by the main motor spring, as hereinafter described, is kept uniform. The operating handle, *e*³, for the segment, *e*⁴, projects through the front of the main frame, *d*¹, in convenient reach of the operator. The gear, *e*⁷, and the rotating disk, *d*, are normally locked by the spring-pressed lever, *f*, having an engaging projection, *f*¹, which engages in a notch, *e*¹⁷, on a disk wheel, *e*¹⁸, connected to or forming a part of the gear, *e*⁷, and connected rigidly to the disk, *d*, the lever, *f*, being kept in its normal position by a spring. There is on the locking lever, *f*, a projecting arm or stud, *f*², and the segment, *e*⁴, is provided with a contacting arm, *e*¹⁹. The disk, *d*, being normally locked and the pinion, *e*⁵, being con-

nected thereto by a ratchet clutch, the handle, *e*³, can be moved by the operator in one direction only, and that is in a direction to wind up the main motor spring *e*. The final movement of the arm, *e*³, in winding up the motor spring brings the contacting arm, *e*¹⁹, in contact with the stud, *f*², on the locking lever, *f*, and withdraws the locking lever from its notch, *e*¹⁷, thus unlocking the disk. When the lever, *e*³, is released the spring will cause the disk to revolve, carrying with it the fan wheel, *e*¹⁶, through the train of gearing before described, the disk making one complete revolution. The projection, *f*¹, on the locking lever, *f*, will ride on the periphery of the disk, *e*¹⁸, and when the disk, *e*¹⁸, has made its complete revolution it will again engage in the notch, *e*¹⁷, and thus lock the parts in their normal position. Owing to the fact that the parts are locked in their normal position until the lever, *e*³, has been moved a complete and full stroke, the winding of the spring is insured before the mechanism is set into motion, and a full and complete operation of the disk thus insured at each full stroke of the lever, *e*³.

The disk, *d*, carries on one side the contacting lugs or pins, *d*², which are adapted as the disk is revolved to successively strike the yielding contacting lever, *g*, and make electrical connection therewith. Adjacent to this rotating disk, *d*, there is a stationary disk-shaped support, *h*, which supports the series of stationary contacts, *h*¹, and these are adapted to be successively engaged by a yielding contacting lever, *h*², which is mounted upon the rotating disk, *d*, but insulated therefrom, the disk-shaped support, *h*, being also formed of insulating material. Electrical connection being made with the disk, this connection is successively transferred to the contacting lever, *g*, through the means of the contacting projections, *d*², on the disk, *d*. The electrical connection being made with the contacting lever, *h*², carried by the disk, *d*, will be successively communicated to the stationary contacts, *h*¹. The contacting lever, *h*², is preferably mounted on an insulating block, *h*³, and an electrical connection is established to said lever through the medium of a hub or trunnion, *h*⁴, mounted on the insulating block and adapted to wipe a spring-pressed arm, *h*⁵, which is mounted on the insulated support, *h*, the connection being established from the trunnion, *h*⁴, by wire, *h*⁶, to the lever, *h*². The contacting levers, *g* and *h*², are preferably formed in the nature of wiping levers, each having an extended portion which engages with the respective contacts, *h*¹ and *d*² for a definite period of time, the construction being such that the contacts, *d*², on the disk may contact with the lever, *g*, immediately before the contact between

the lever, h^2 and the contacts, h^1 . The contact between the lever, g , and the projections, d^2 , is maintained until after the wiping lever, h^2 , has passed the projections, h^1 , so that the electrical connection between the wiping lever, h^2 , and any one of the projections, h^1 , is made and broken during the contact between the disk, d , through the projections, d^2 , and the wiping lever g .

10 Preferably mounted on the frame, d^1 , is a series of spring switches, j , adapted when pressed inwardly to form an electrical connection, and each one of these switches is placed in a line which leads from the stationary projections or contacts h^1 . All of these lines therefore are normally opened, and these switches are so arranged that when one switch is in contact or closed all the others will be released so that but one switch will be closed at any given time. I also preferably mount on the frame work of the machine a circuit closing device, k , adapted when the rotating disk, d , has made a complete revolution to be closed by means of the cam, k^1 , mounted on an extension of the shaft, e^8 , which carries the disk. This circuit closer, k , is a part of the ringing circuit, as will be more fully hereinafter described, and provides for automatically sending a ringing current on the line at each revolution of the disk. I also mount in the frame a three-positioned circuit closer, l , adapted when in the different positions to make and break certain electrical connections which will be hereinafter more fully specified, the detail of this circuit closer being shown in Fig. 9.

The electrical connections will perhaps be better understood by reference to the diagrammatic Figs. 1 and 2. Connection is made with the sleeve side of the main line direct to the disk, d , as indicated by circuit 1, and connection is made from ground through battery, R, to the contacting lever, g , by circuit 6. The sleeve side of the line, as before stated, is connected at each subscriber's station through the magnet, a , to ground so that whenever the disk, d , is rotated the electrical impulses will be successively imparted from the battery, R, contacting lever, g , and contacts, d^2 , through this step-up magnet, a , to ground at the respective subscribers' stations, thus causing the step-up device at the different stations to be moved in unison.

From the generator, g^x , connection is established by line 2 to the sleeve side, S, of the main line, and by line 3 to one side of each of the switches, j , and connection is made by line 4 from T to contacting lever, h^2 , on the disk. Whenever any switch, j , is closed, a metallic circuit is formed from the condenser and generator to the two sides of the line, and through the selector magnet, b ,

at a station whenever the contacting lever, h^2 , makes electrical connection with the contacting device, h^1 ; corresponding to the closed switch. The result of this is that at this particular moment an electrical impulse will be sent from the generator through the selector magnet, b , at that station at which the contact, a^2 , of the step-up device is in electrical connection with the contact, a^3 , in the line including the magnet b . This magnet will therefore be energized and establish a talking circuit through the talking instruments at that particular station. Inasmuch as no other station will be in contact at this time, and inasmuch as the closing of one switch would release the others, only one switch would ordinarily be closed at the same time.

It should be noted that in the diagrammatic view of the respective stations on the line the upper part represents the selecting and connecting mechanism, the line connections being made to the binding posts, x^1 , x^2 , x^3 , which represent, respectively, the sleeve, tip and ground connections. The lower portion of the figure represents the subscriber's usual outfit, that is, the signaling and talking mechanism, this being connected to the binding posts, x^4 , x^5 , x^6 and x^7 . The signaling apparatus, n , of the subscriber's outfit is normally connected across the line through posts, x^6 and x^7 , and through circuits, n^1 and n^2 , the circuit, n^1 , passing from the binding post, x^2 , to the step-up rod, a^1 , and through the step-up rod to binding post, x^7 . The subscribers' talking instruments may also be bridged across the line by the operation of the main switch, o , from the binding post, x^4 , to x^7 , through circuit, o^1 , when the telephone is removed from the hook, this circuit passing through the selector apparatus from the binding post, x^4 , to the circuit, o^2 , and condenser, o^3 , to the binding post, x^1 , on the S side of the line. It will be noted that upon the first movement of the step-up rod, a^1 , both of these circuits will be broken and no connection can be made with the main line until the circuit is reestablished by the selector magnet, b , operating the circuit closing device, b^1 . The operation of this circuit closer, b^1 , establishes a new connection across the line from binding post, x^2 , and through circuit breaker, b^1 , line, b^2 , and binding post, x^5 , thence through bell, b^3 , hook, o , and circuit, o^1 , and condenser, o^3 , to the other side of the line, and also through circuit breaker, b^1 , line, b^4 , binding post, x^7 , and magneto, N, binding post, x^6 , and line, n^2 , to the opposite side of the line, this circuit being normally broken except when the magneto is in use by the usual automatic magneto-switch. When the subscribers' talking instruments are brought into use by the main switch, o , then

the circuit will be from binding post, w^2 , to circuit breaker, b^1 , line, b^4 , post, w^7 , line, o^4 , through the talking instruments and telephone switch, o , to post, w^4 , and line, o^2 , condenser, o^3 , to binding post, w^1 , the bell, b^3 , being cut out in the usual way. The circuit for the selector magnet, b , is from the binding post, w^1 , through the condenser, o^3 , circuit, o^2 , which includes the magnet, b , contact a^2 , step-up rod, a^1 , and frame, to binding post, w^2 , or the tip side of the line.

It will be remembered that the step-up magnet, a , is included in the circuit from the sleeve side of the line, or binding post, w^3 , to ground, and the clearing out magnet, c , is placed in the circuit from the opposite or tip side of the line to ground, that is, from binding post, w^2 , circuit, o^5 , including a circuit breaker, o^6 , to binding post, w^3 , and ground; the circuit breaker, o^6 , being operated by the step-up magnet, a , whenever said magnet is energized to move the step-up rod, a^1 . This circuit breaker, o^6 , being operated every time the step-up magnet is operated prevents any possibility of the clearing out magnet being operated by the ringing current. Means are also provided that whenever the ringing current is put on the line to ring the station selected, it also operates the step-up magnet and breaks the clearing-out circuit, at o^6 , for the same reason as will more clearly appear hereinafter.

The clearing-out magnet is operated by the main battery, R, from ground at the central station through the tip side of the line and circuit, o^5 , as before described, to ground at the different stations on the line, all the clearing-out magnets being operated in unison so that all the step-up devices are returned to their normal positions when the line is free.

I have already described the operation of stepping-up the different step-up devices and of selecting the particular station desired, and this operation is followed in sequence by the automatic ringing through the automatic ringing key, k , as indicated. In order, however, that this ringing may not affect the clearing-out magnet, the automatic ringing key, k , is provided with two contacts, k^2 k^3 , which operate successively. The first of these contacts establishes a connection between the tip side of the line from T to ground, through circuits 4 and 5. This is immediately followed by closing the contact, k^3 and circuit 3 to the generator, thus connecting the side T to the generator, the generator being permanently connected at one side to S through circuit 2. A connection is thus established by the automatic ringing cam, k^1 , from the generator to ground, and also by metallic circuit to the bell of the station selected. Two paths are thus created for the ringing current, one

through the bell by metallic circuit, and one from generator to ground, thence to post w^3 through the step-up magnet thence by S back to generator, so that the step-up magnet will be operated sufficiently to break the contact at o^6 and prevent the operation of the clearing-out magnet by the ringing current which might take place by reason of the fact that the alternating ringing current is on both sides of the line, both sides of which are grounded. The same result takes place when operating the ringing key, l , the first movement being to establish a ground connection from T through the contact l^1 , and circuits 4 and 5, and a connection from the generator to T through the contact, l^2 . The ringing key, l , is of the usual ringing and listening type. It is connected, however, in my system so that while one movement of the lever effects the ringing of the subscriber called, the other movement operates the clearing out device, the clearing-out being accomplished by closing the contact, l^3 , which establishes a connection from ground through battery, R, to T, thence through the clearing out magnet to ground at the subscriber's station. This movement also closes the contact at l^5 and breaks the contact at l^6 . The first grounds the sleeve side of the line through circuits 6 and 5, and the second breaks the connection from the generator to ground (if closed at automatic ringing switch) to prevent a short circuit which would otherwise momentarily take place at the central exchange and result in burning the contact points, in case the automatic ringing switch were closed.

From the above it is believed that the operation will be clearly seen. Pulling down the handle, e^3 , at the central station winds up the spring and when the handle has been pulled to its limit and released, the disk will be moved by the spring one complete revolution, the contacting devices thereon passing by the lever, g , a circuit is closed l to S and to ground through the step-up magnets at the various stations, thus stepping up the device. A circuit being closed from one side of the generator to any one of the stationary contacts, h^1 , will cause a current to pass from the generator to both sides of the line and operate such selector magnet as is at that moment bridged across the line by the contact of the projection on the step-up rod, closing the circuit at the subscriber's station corresponding to the key depressed at the central station. At this moment all other subscribers' stations are cut off by the breaking of the circuit at the first movement of the step-up rod. The selection having been made will be retained by a suitable retaining device, and when the disk has completed its revolution the ringing cam, k^1 ,

will operate the circuit closers, k^2 k^3 , which results in establishing two paths for the ringing circuit, one through the step-up magnet to ground, and the other, metallic, through the subscribers' instruments which have been brought into connection by the selector magnet, thus ringing this subscriber and no other subscriber. This ringing continues so long as the cam, k^1 , is passing these contacting devices. In the event no answer is obtained, further ringing can be accomplished by the ringing key, l^1 , which is in multiple with the circuit breakers in the automatic ringing and produces the same result, viz.: operates the step-up magnet from the generator by a grounded circuit and rings the subscriber's bell by the metallic circuit on the two sides of the line. When the conversation is finished, the devices are returned to their normal positions by the operation of the key, l , which establishes a connection from grounded battery, R, at central station through T and the clearing out magnet, c , to ground, at each station. It also breaks the ground connection to the automatic ringing so that in the event the key should be pushed while the switches of the automatic ringing devices are still in contact, short circuit would be prevented, and it also establishes a ground connection from the sleeve side of the line which prevents any operation of the step-up magnet while the clearing out is being effected, in the event there should be a connection across the line through an annunciator or "drop," as is frequently the case, at the central station.

In Fig. 13 the circuits at the sub-station which lead from the T side of the line, or binding post, α^2 , are omitted, as in the regular instrument the connections extend through the frame of the step-up and selective device. The binding post, α^2 , is connected directly to the frame as is also the step-up rod, α^1 , and the other frame part. The circuits from this are clearly indicated however in Fig. 1 and can be placed in Fig. 13 by assuming that the armatures of the step-up and selective magnets and the step-up rod are in electrical connection with the frame which is also in electrical connection with the binding post, α^2 .

While I have described this apparatus as having one step for each line, it of course will be possible to put two or more of the contacting flanges on the same step, in which case all of those contacts which are on the same step will be called at the same time.

It has been stated that the closing of one of the spring switches, j , releases all the other switches. It is possible, however, to close two or more switches at the same time and these switches will remain and be held in their closed positions, thus making it pos-

sible to get two or more subscribers on the same line at the pleasure of the operator. The subsequent closing, however, of another switch would release all of the closed switches so that in the normal operation of the machine only such subscriber as is desired by the operator will be connected to the line.

Having thus described my invention, I claim:

1. In a party line telephone system, a series of sub-stations and a central station, a main line connecting said central station with the other stations by a metallic circuit, a ground connection at the central station and at each of said sub-stations, a source of direct current supply and a source of alternating current supply at said central station, a step-up magnet and a selective magnet and a release magnet at each of said sub-stations, means for connecting one of said magnets successively from one side of the line to ground from one source of supply and for connecting the other magnet from the other side of the line to ground from said source of supply, and means for connecting the other magnet by a metallic circuit from the other source of electrical supply, substantially as and for the purpose specified.

2. In a party line telephone system, a central rotating device having successive contacts to establish an electrical connection from a central station, a series of step-up magnets at each sub-station connected thereto, a rotating contact operating simultaneously therewith to contact successively with a series of contacts in normally open circuits, a circuit closer in each of said circuits and means connecting said circuit closers to prevent the operation of more than one of said circuit closers at the same time, a selective magnet at each sub-station and means for establishing an electrical connection through a selective magnet at one of said sub-stations when one of said circuits is closed and by the operation of said rotating device, as specified.

3. In a party line telephone system, a central exchange device consisting of a spring-actuated rotating mechanism, an operating lever adapted to wind up and release said mechanism by a single operation of said lever and to perform one complete revolution at each operation of said lever, two series of contacts connected to two different sources of electric supply, each of said series of contacts being connected electrically to a different source of electric energy, one source being direct and the other source alternating, and one series of connections being adapted to establish a grounded circuit on one side of the line and the other series of connections being adapted to establish a metallic circuit on both sides of the line, a step-up

magnet and a selector magnet at each sub-station, one of said magnets being in the grounded circuit and the other of said magnets being in the metallic circuit, a series of switches at the central station, one for each station, in lines leading to one of said series of contacts whereby a single operation of said exchange mechanism will send a series of electrical impulses through one of said magnets at each sub-station and one electrical impulse through the other magnet at one station, as and for the purpose specified.

4. The combination with the rotating step-up and selector device operated by a single stroke of an operating lever and adapted to send electrical impulses of different characters over the line connecting the several stations, and automatic ringing devices also connected to said rotating device adapted to close a circuit with an alternating current supply across the line when the device has made a complete movement, as and for the purpose specified.

5. The combination with a rotating step-up and selective device at the central station having two series of contacts connected to sources of electric supply of different characters, a step-up and a selector magnet at each sub-station adapted to receive electrical impulses from one of said sources of supply through the said contacting devices, a clearing-out magnet at each sub-station and a manually-operated ringing and clearing-out key adapted when in one position to establish a ringing circuit on the metallic line and when in the other position to establish the circuit from one source of supply to the opposite side of the line and to ground through the clearing-out magnet at each sub-station, as and for the purpose specified.

6. In a party line telephone system and in connection with a rotating step-up and selective device at the central station, a ringing and clearing-out key also at said central station, a step-up and selector magnet and a clearing-out magnet at each of the sub-stations, a direct current battery and an alternating current supply at said central station, said battery being connected to one series of contacts in the rotating device and said alternating current supply being connected by normally open branch lines to the other series of contacts, means for preventing the closing of more than one of said branch lines at the same time, a step-up magnet normally grounded to one side of the line at each sub-station, and a step-up device adapted to bridge the selector across the line on a predetermined movement of said step-up device, and said selector magnet being adapted to establish a talking circuit through a condenser across said line, a clearing out magnet at each sta-

tion adapted to be connected to the opposite side of the line to ground, and means for breaking said clearing-out circuit at each sub-station at each operation of the step-up magnet, as and for the purpose specified.

7. In a party line telephone system, the combination with a series of stations on a single line, selective devices for automatically selecting any one of said stations from the central station, an automatic device for establishing a connection from a ringing circuit to said station when selected, a release magnet at each of said stations and a manually operated key for also establishing a ringing circuit from the central station to said selected station, said key being adapted also to establish a circuit from the central station to the release magnet at each of said sub-stations, and a normally grounded connection leading to said automatic and manually-operated ringing devices, and means for breaking said ground connection upon the operation of said clearing-out device, for the purpose specified.

8. In combination with a rotating step-up and selective device, a series of step-up instruments on a single line, each of said instruments having a step-up magnet and a selector magnet, contacting devices on said step-up and selector mechanism adapted to send electrical impulses of different characters through the different magnets, the contacting devices of one series being adapted to close a circuit before the corresponding contacting devices of the other series and to maintain said circuit until after the circuit of the other series is broken, as and for the purpose specified.

9. In a central exchange apparatus for party lines, a rotating contact device having means for successively connecting a source of electric supply to the line, a main motor spring for operating the device, a pivoted operating lever for winding up said motor spring, means for holding said contacting device against revolution until said motor spring has been completely wound and for releasing the same when said spring is wound, and an automatic contacting device adapted to send a ringing current over said line at or near the end of the stroke of said contacting device, as set forth.

10. In combination with a rotating selective central exchange device for party lines having an automatic ringing device connected therewith, of a manually-operated ringing device, said automatic ringing and manually ringing devices being connected on one side of the line to ground, and means for grounding the opposite side of the line upon the operation of the manually ringing device, as and for the purpose specified.

11. In a party line telephone system and

in combination with a series of stations on
a single line, selecting devices for automati-
cally selecting any one of said stations from
a central station, a release magnet at each
5 of said stations, a releasing switch at the
central station adapted to establish a con-
nection from one side of the line through
said release magnet to ground, and means
for simultaneously grounding the other side

of the line upon the operation of the said 10
switch, as and for the purpose specified.

In testimony whereof, I have hereunto set
my hand this 3rd day of August 1907.

WILLIAM M. BRUCE, JR.

Witnesses:

CHAS. I. WELCH,

W. H. CHRISTMAN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
