

No. 779,892.

PATENTED JAN. 10, 1905.

W. D. WATKINS.  
TELEPHONE SELECTING SYSTEM.

APPLICATION FILED MAY 1, 1903.

4 SHEETS—SHEET 1.

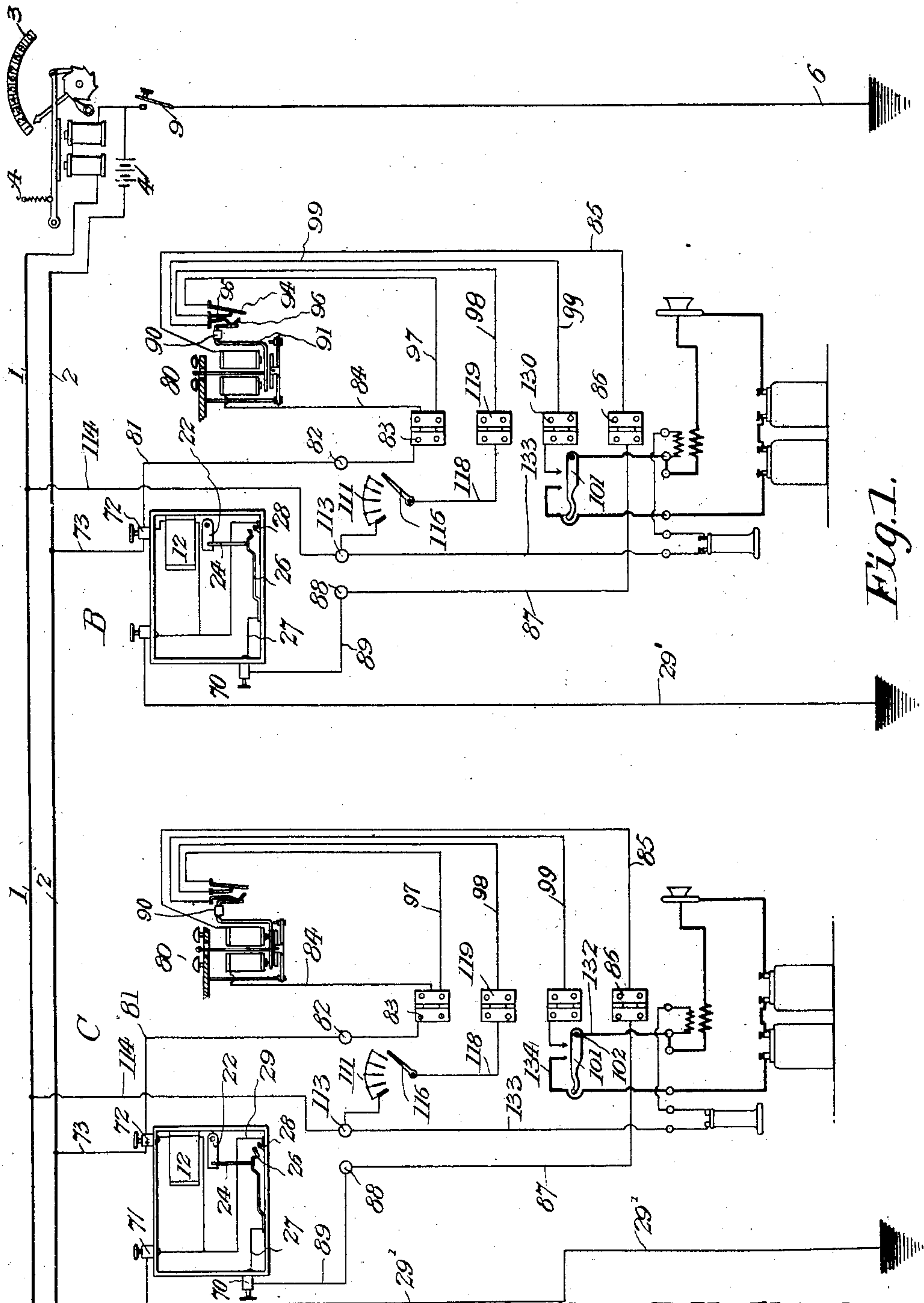


Fig. 1.

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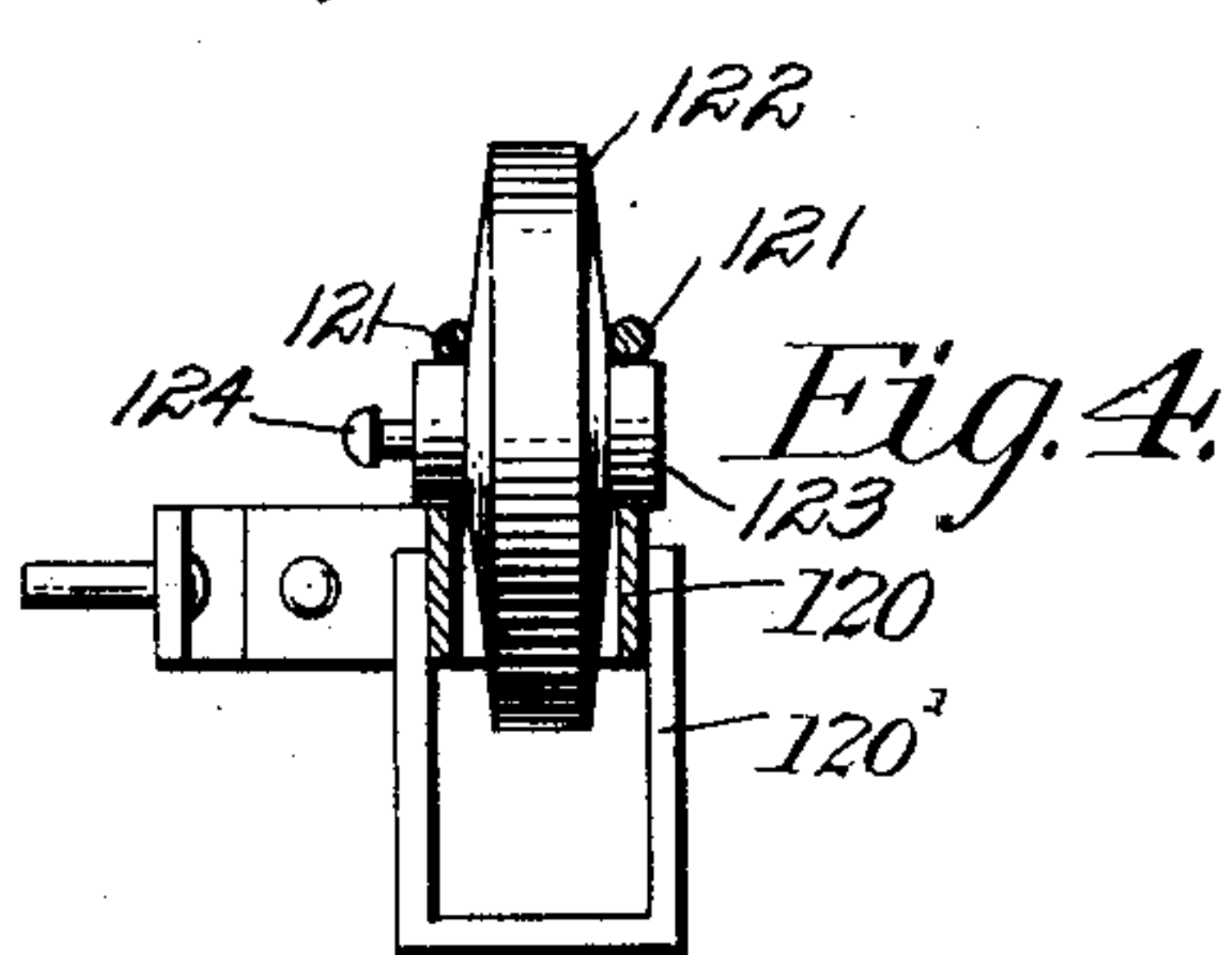
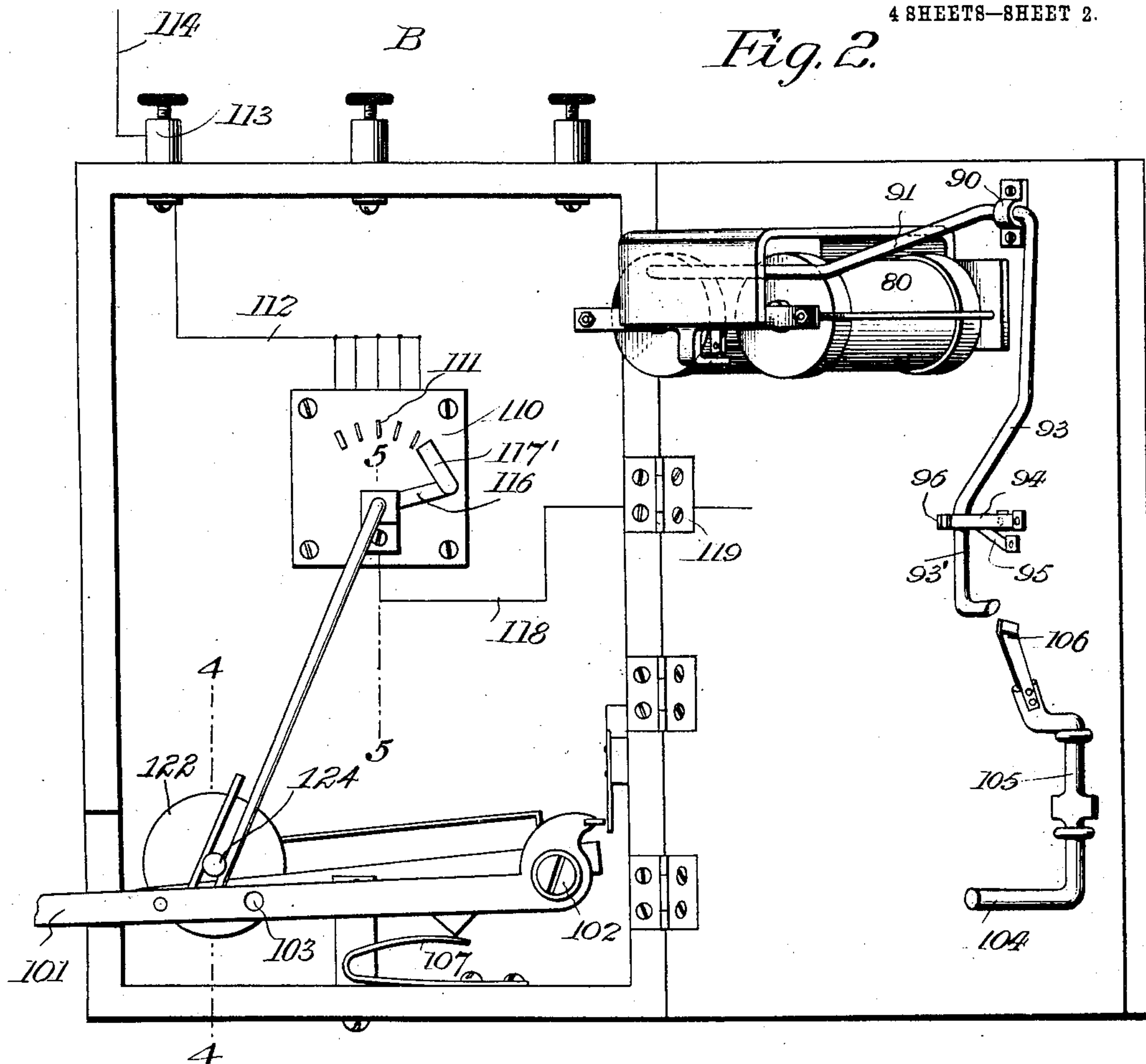
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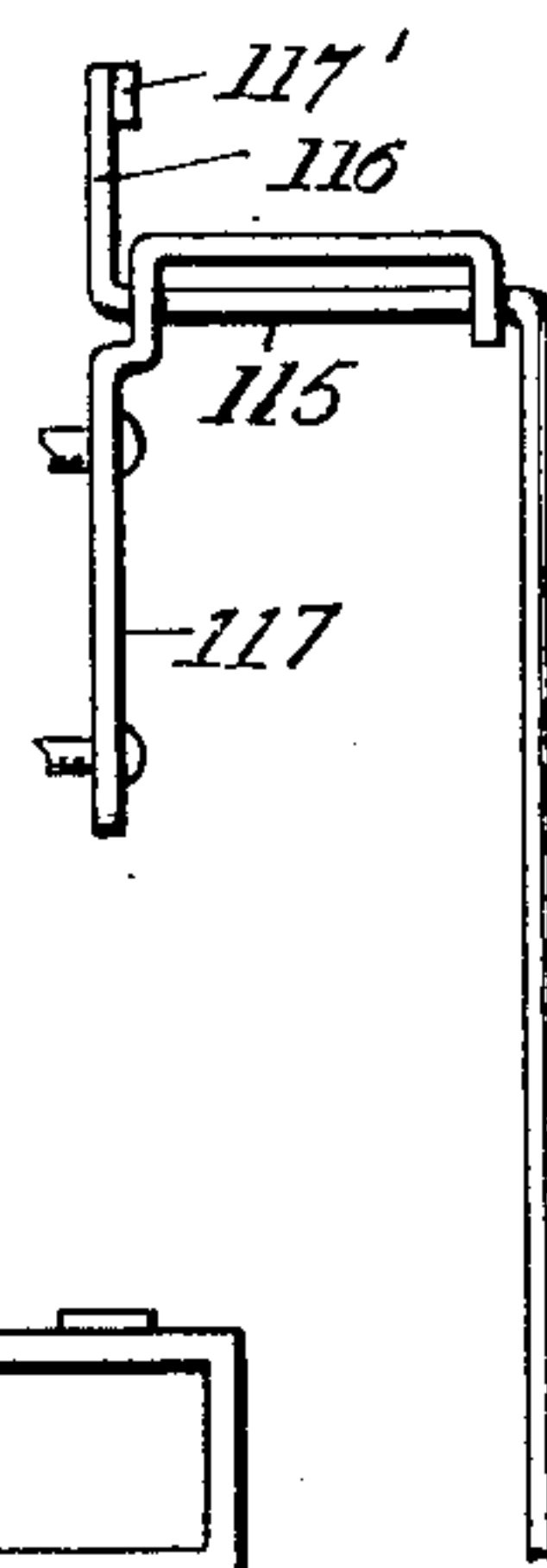
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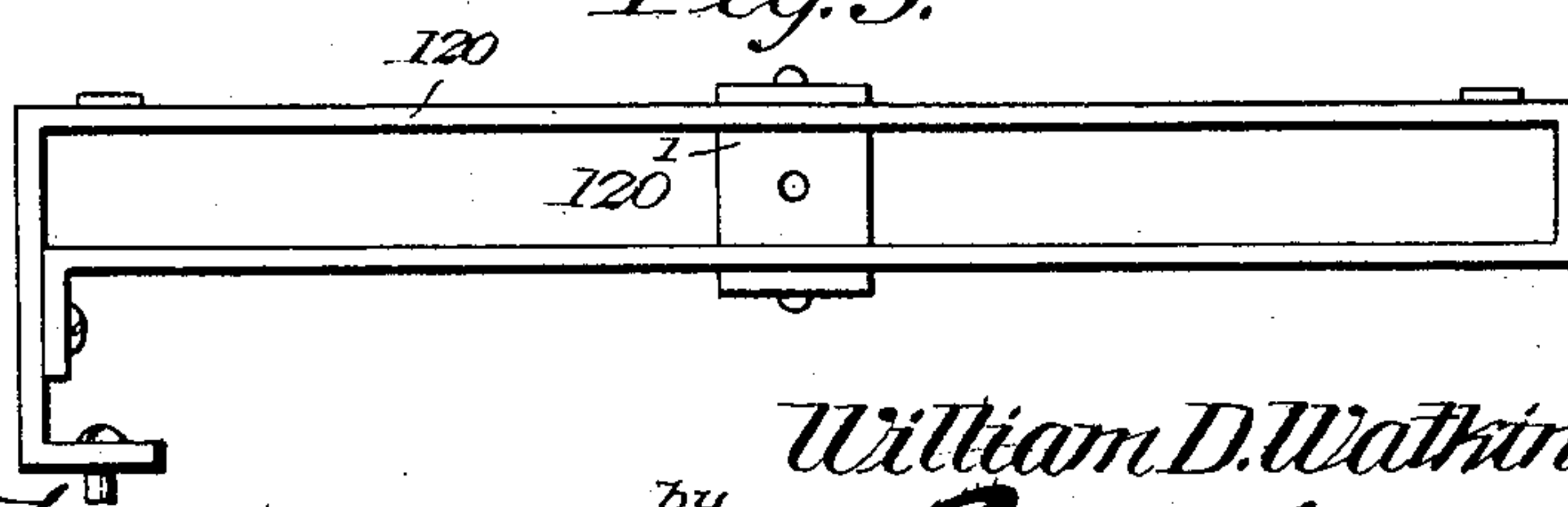
4 SHEETS—SHEET 2.



*Fig. 5.*



*Fig. 3.*



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4 SHEETS—SHEET 3.

Fig. 6.

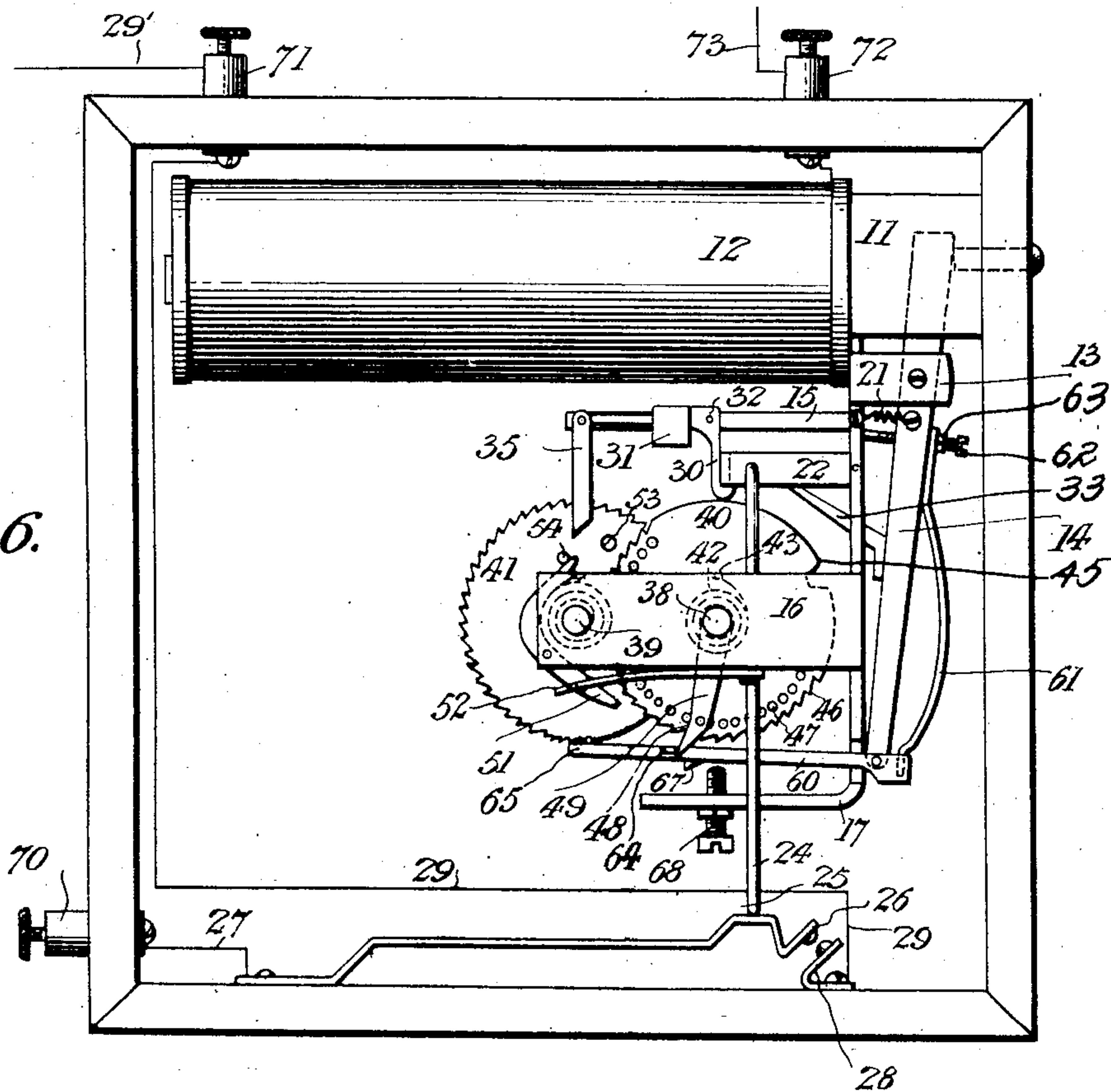
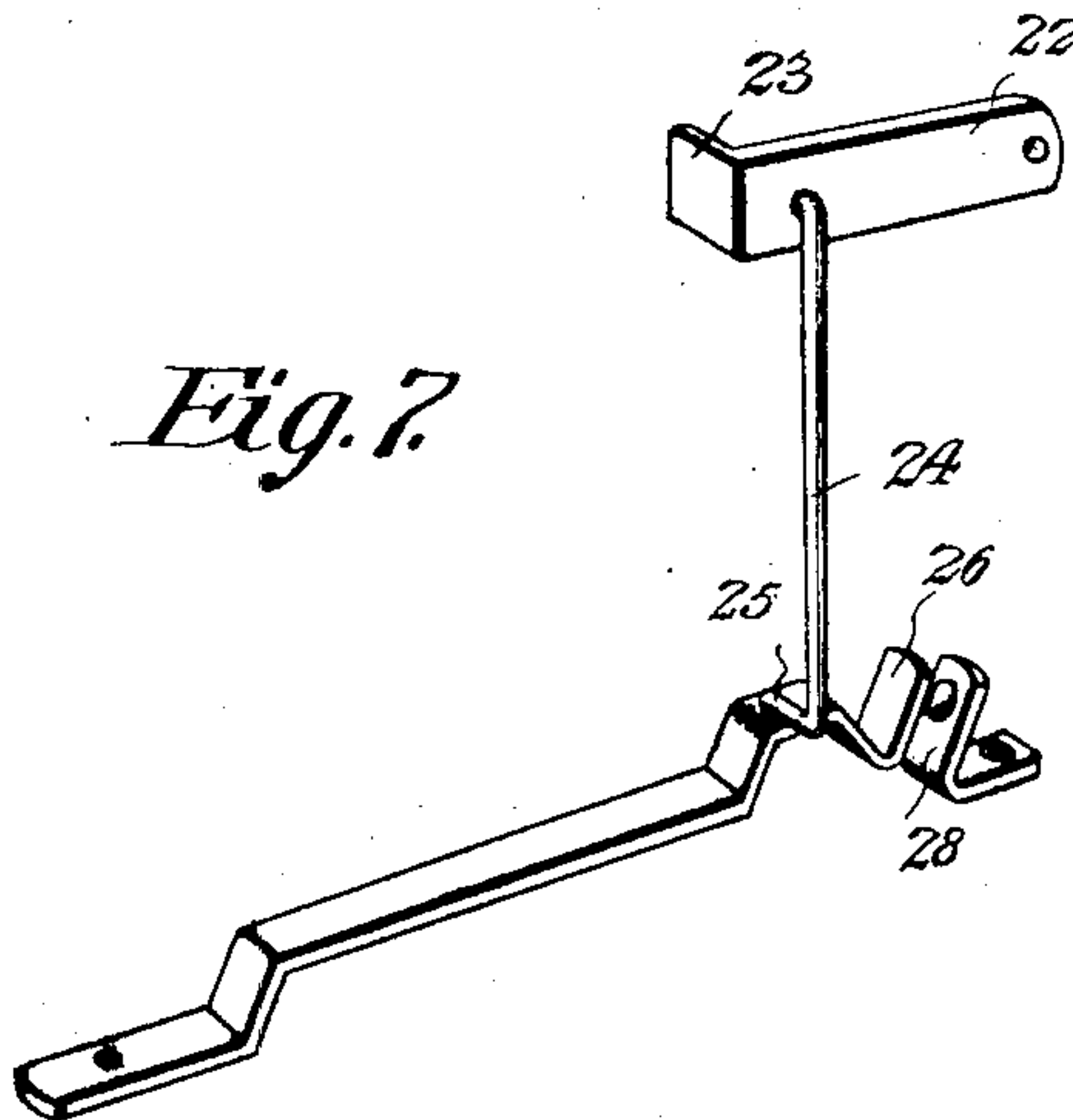


Fig. 7.



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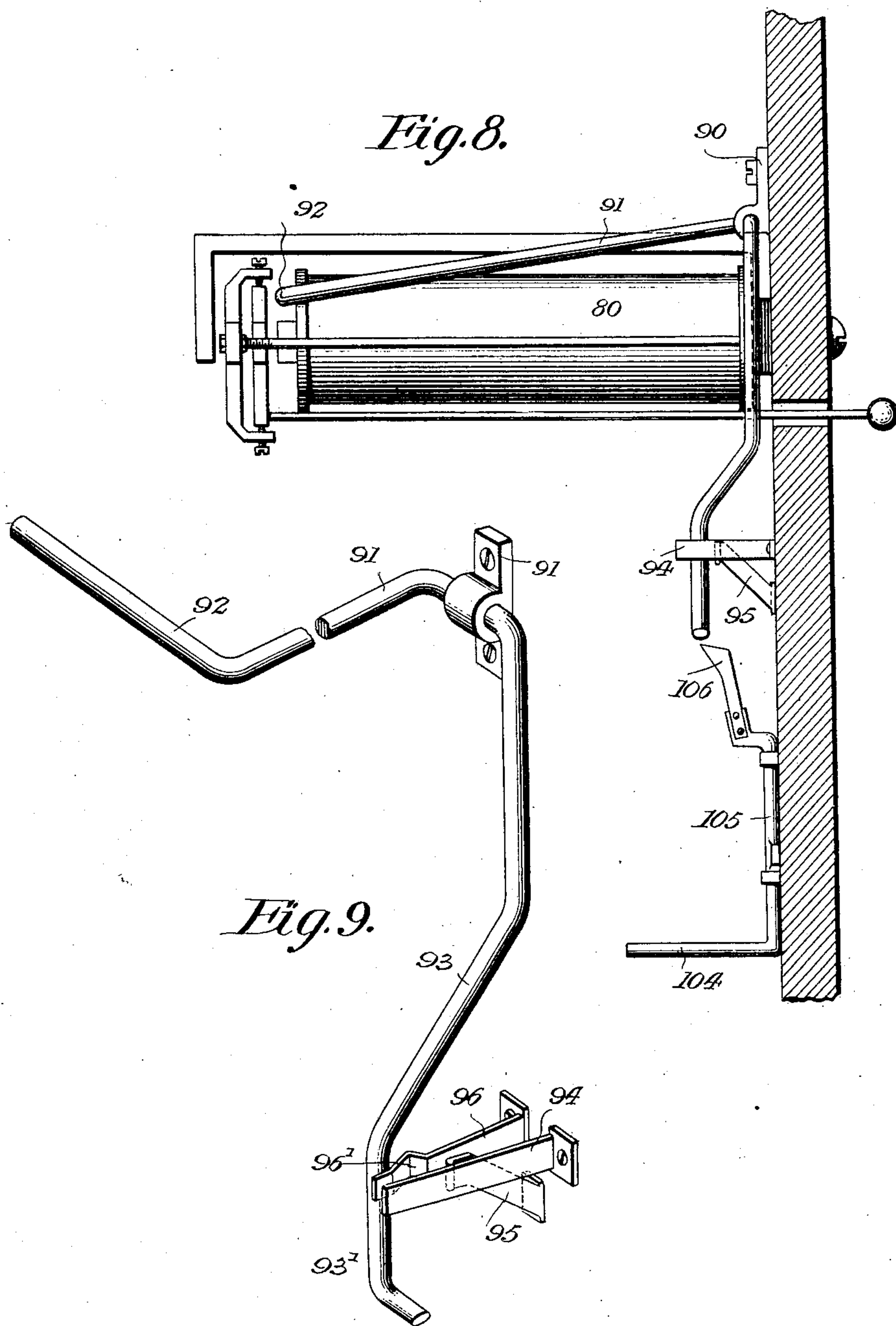
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4 SHEETS--SHEET 4.





# UNITED STATES PATENT OFFICE.

WILLIAM DAVID WATKINS, OF SAN JOSE, CALIFORNIA.

## TELEPHONE SELECTING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 779,892, dated January 10, 1905.

Application filed May 1, 1903. Serial No. 155,193.

*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 System, of which the following is a specification.

This invention relates to certain improvements in telephone selecting systems.

The principal object of the invention is to provide a selecting system, adapted especially for use on party-lines, whereby all of the subscribers' telephones will be placed wholly under the control of an operator at the central station, it being impossible for any one subscriber to call another subscriber except through the intervention of central.

A further object of the invention is to provide a system by means of which it will be impossible for any subscriber to break in on the line while the latter is in use or to call the central station before the operator at the latter point has answered a previous call.

A still further object of the invention is to provide at each subscriber's station an automatic switching mechanism by means of which the number of the subscriber's telephone is signaled to central automatically on the removal of the receiver from the receiver-hook.

A still further object of the invention is to provide means operable on the return of the receiver to the hook for immediately cutting out a telephone and rendering it impossible for the subscriber to use the talking-circuit until he is again connected by the operator at central.

A still further object of the invention is to so arrange and construct the mechanism forming part of the system as to permit its ready application to existing telephone systems.

With these and other objects in view the invention consists in the novel construction and arrangement of parts hereinafter 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 invention.

In the accompanying drawings, Figure 1 is a diagram of a telephone selecting system arranged in accordance with the invention. Fig. 2 is an elevation of a telephone switch-box, the door being partly open, illustrating the receiver-hook-controlled mechanism for signaling central and the arrangement of the switches controlled by the electromagnets of the call-bell for closing the talking-circuit. Fig. 3 is a plan view of the gravity-track connected to the receiver-hook and forming a part of the circuit-closing device arranged at each local station for signaling central. Fig. 4 is a transverse sectional elevation of the same on the line 4 4 of Fig. 2. Fig. 5 is a similar view on the line 5 5 of Fig. 2. Fig. 6 is an elevation of the selecting mechanism and its containing-casing. Fig. 7 is a detail perspective view of a circuit-closing means forming a part of the selecting mechanism. Fig. 8 is a transverse sectional elevation through the lid or cover of the telephone switch-box, illustrating the arrangement of the electromagnets of the call-bell and the circuit-closing means controlled thereby. Fig. 9 is a detail perspective view of the auxiliary armature and the circuit-closing means under its control.

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

In the drawings, A indicates a central station, and B and C local or subscribers' stations, the several stations being connected by line-wires 1 and 2.

At the central station is an indicating device 3, connected between the two line-wires and energized by a battery 4 each time the circuit on the main line is closed. The main line may be grounded, as indicated at 6. The construction of each subscriber's station is the same, and the connections from the line-wires 1 and 2 are through local wires 114 and 73, respectively.

In each subscriber's station is placed a selecting device including an electromagnet, which will be energized each time the operator at central closes the circuit by the key or



similar circuit-closing device 9, and said selecting device may be of any suitable character capable of closing the calling-circuit after movement to a predetermined position, the position or extent of movement being different at each subscriber's station and being under the control of the central station exclusively.

It is preferred to employ a selecting mechanism of a construction somewhat similar to that illustrated in an application for Letters Patent filed by me on August 29, 1902, under Serial No. 121,531, and to which reference is made for exact details of construction, and when the apparatus is to be applied to telephone systems already in use it is preferred to place this selecting mechanism in a separate box or casing distinct from the telephone and preferably disposed at a sufficient distance therefrom to prevent annoyance to the subscriber from the clicking sound made at all the stations when central is calling any one of them.

In the selecting mechanism, 11 indicates a frame provided near its upper end with arms for the support of one or more electromagnets 12, the frame being preferably formed of diamagnetic metal. The central bar of the frame is provided with rearwardly-bent arms 13, having openings for the reception of pivot pins or screws of a soft-iron armature 14 for actuating the disk of the selecting mechanism. The central portion of the main bar is cut out to form a tongue 15, which is bent forwardly at a right angle to the plane of the frame and forms a support for some of the locking members. Near the lower end of the frame are two forwardly-bent arms 16, having suitable openings for the reception of the pivot-pins of the locking and guard disks, and the extreme lower end of the main bar is bent forwardly to form a horizontally-disposed bar 17. The soft-iron armature 14 is attracted each time the magnets are energized and is returned to initial position by a spring 21 when the magnets are deenergized.

To the main frame is pivoted a bar 22, having at its free end a tongue 23, passing under the arm 15 of the frame and provided with a depending arm or rod 24, having a laterally-bent lower end 25, which is disposed immediately above a spring-contact 26, secured at one end to the frame or casing and electrically connected to a current-conducting wire 27. The contact 26 is arranged immediately above a contact-plate 28, carried by the casing, and electrically connected to a current-conducting wire 29. The arm 22 is engaged and held in elevated position by a catch 30, formed of a strip of metal having an integral counterbalance portion 31 normally holding the catch in engaging position. This catch is pivoted on a pin 32 at one side of the arm 13, and its engagement with the arm 22 is automatic, the

arm 22 being elevated to engaging position by the inward movement of the lower end of the armature 14 each time the electromagnets are deenergized, said armature having a projecting finger 33 for engagement with the under side of the arm. The arm 22 need only be elevated after an operation of the selecting mechanism of which it forms a part, and while the finger 33 comes into contact therewith at each movement of the soft-iron armature a movement of the arm is only effected after said arm has been dropped to cause the engagement of the contacts 26 and 28. To permit the return movement, the under side of the catch is curved or inclined, so that contact with the locking-arm serves to force the catch outwardly until the arm reaches the locking position, after which the counterweight of the catch moves the latter to locking position.

The locking-catch is released by means of a bell-crank lever 35, pivoted near the outer end of the arm 13 and having a horizontal arm extending under the counterweighted end of the catch and a vertical arm adapted to be engaged and moved to release the catch by a projecting pin on the guard-disk.

The lower arms 16 of the frame have threaded openings for the passage of pivot-screws which engage the opposite ends of spindles 38 and 39, carrying, respectively, the locking-disk 40 and guard-disk 41, and on each of said spindles is a light spiral spring 42, connected at one end to the spindle and at the opposite end to a stationary pin 43, projecting from the frame, these springs serving to turn the disks to an initial position after each operation of the selecting mechanism and, further, to act in connection with the armature to effect a rapid oscillatory movement of said guard-disk.

The locking-disk 40 is provided at one point in its periphery with a notch 45, which is adapted to receive the lower portion of the locking-arm 22 when the notch has been moved to a position immediately under said bar. This disk is further provided with a number of peripherally-disposed ratchet-teeth 46, and within the line of the teeth is a row of openings 47 of a number equal to the number of ratchet-teeth, said openings being adapted for the reception of a pin 48, carried by a radially-disposed arm 49, which is free to turn on the spindle 38 to any desired position, and then locked by the engagement of its pin in one of the openings 47. The extreme end of the arm 49 is projected beyond the periphery of the locking-disk and forms an extension of the disk-tooth with which it is in alinement, and the position of this tooth and its disk determines the number of times which it is necessary to close the circuit to effect a movement of the locking-disk until the locking-arm 22 and the notch 45 are in alinement. The construction permits of the manufacture of the device by stamping, each telephone on the line being



provided with a similar mechanism and the arm 48 being adjusted at an angle from the notch 45 depending upon the number of the telephone. The locking-disk receives a step-by-step rotative movement and is locked in position at each movement by a pivoted pawl 51, carried by one of the arms 16 and held by a spring 52.

The disk 41 has a toothed periphery and is provided with two laterally-projecting pins 53 and 54, disposed at different distances from the center of rotation of said guard-disk. This disk receives a comparatively rapid oscillatory movement, and at the beginning of the movement the pin 54 moves from contact with the tail of the pawl 51, which is normally held away from the locking-disk when the device is not in operation, and at the same time the pin 53 moves beyond the lower inclined end of the depending arm of the bell-crank lever 35 and is retained outside the arm until the locking-disk has been moved to releasing position, at which time the guard-disk will be returned to its normal position by the spring 42, and the bell-crank lever will be moved in such manner as to raise the catch 30 and remove the same from engagement with the locking-arm 22, and after this the pin 54 will move to release the disk-locking pawl 51.

Secured to the lower end of the armature 14 is a pawl-bar 60, preferably formed of a sheet of stamped metal, having one end pivoted to the armature and maintained in proper position by a spring 61, carried by the armature and extending inside the bent portion of the pawl-bar. As a convenient means for holding the spring in position the armature stop-screw 62 is provided with an auxiliary nut 63, which confines the spring in place and at the same time acts as a jam-nut for holding the stop-screw in adjusted position. The pawl-bar carries two pawls 64 and 65, adapted, respectively, to engage the teeth of the locking and guard disks, and is further provided with a downwardly-bent inclined lug 67, which is adapted to engage with the upper end of a screw 68 when the soft-iron armature is attracted and the bar is moved outwardly. The screw 68 is carried by a threaded opening in the lower horizontal arm 17 of the frame.

In the operation of the device the central station energizes the circuit, and the disks of all the subscribers' stations move simultaneously until the notch 45 of the locking-disk at the station of the selected subscriber arrives under the locking arm 22. On the last impulse sent by the operator at central the circuit is held closed for a considerable period of time and the guard-disk 41 is allowed to return to its initial position, the pin 53 engaging the bell-crank lever 35 and moving the horizontal arm of the latter upward under the counterweight of the catch 30 and moving said catch to releasing position. The locking arm 22 then falls to its lowest position and as the depending

arm 24, carried by said arm, forces the contact 26 against the contact 28 closes the circuit between the wires 27 and 29. The pin 54 then makes contact with the pawl 51 and moves the latter in such manner as to release the locking-disk; but the latter cannot at this time return to its normal position, owing to the presence of the locking-arm in the notch 45. When the circuit is broken by the operator at the central station after the final impulse, the armature 14 is released and is moved by its spring until the arm 33, carried by the armature, engages under the locking-arm 22 and forces the latter into engagement with the catch 30. This raises the depending arm 24 and breaks the circuit between the wires 27 and 29. The locking-disk then returns to its initial position under the influence of its spring and the parts are again in readiness for another operation.

On reference to Fig. 1 it will be seen that the box or casing which contains the selecting mechanism is separate and distinct from the phone and for convenience is provided with three binding-posts 70, 71, and 72, the binding-post 70 being connected to the wire 27 and the binding-post 71 being connected to the wire 29, and from said binding-post 71 extends a wire 29' to ground. The binding-post 72 is connected by a wire 73 to the main line-wire 2, and from thence the wire is continued through the electromagnet 12 and at the opposite end of the coil of the magnet is connected to the wire 29, so that the impulses sent over the wire 2 from the central station will be conducted through the wire 73 by binding-post 72, electromagnets 12, to wire 29, to binding-post 71, to wire 29' and ground, these impulses continuing during the operation of the selecting mechanism and all of the remaining portion of the local system being cut out, owing to the break between the contacts 26 and 28.

80 designates the electromagnets of an ordinary form of call-bell, including a polarized armature and clapper-rod, and said electromagnets are connected in a circuit leading from the wire 73 through a wire 81 to binding-post 82, hinge 83, wire 84, electromagnets 80 wire 85, hinge 86, wire 87, binding-post 88, and wire 89 to binding-post 70, and from the binding-post 70 the circuit continues through wire 27 to spring-contact 26, so that when the selecting mechanism is properly operated and the depending rod 24 is dropped a circuit will be established, as before mentioned, and through the contacts 26 and 28 to wire 29, binding-post 71, and wire 29' to ground. The current entering the wire 73 from the main line-wire 2 will be divided, a portion flowing through the electromagnet 12 of the selecting mechanism and maintaining the armature thereof in attracted position and another portion leading through the electromagnets 80 and causing the sounding of the



call-bell, the call-bell continuing to sound so long as the circuit is maintained closed by the operator at central. By the mechanism thus far described the central station may sound  
 5 a call-bell of any desired subscriber without sounding the bell of any other subscriber, and while all of the selecting mechanisms are operated each time the circuit is closed at the central station this selecting mechanism may  
 10 be placed at any desired distance from the phone in order that the clicking noise made may not annoy the subscriber, who will only be notified of the fact that the line is in operation when his call-bell is sounded.

15 To the casing or other support, at a point adjacent to the electromagnets 80, is secured a small bracket or clip 90, forming a pivotal support for a rod 91, formed of iron or similar magnetizable material and provided with  
 20 an end portion bent at right angles and disposed within the field of force of the electromagnet 80, preferably at a point slightly above the poles of the magnet, but so arranged as not to interfere with the free movement of  
 25 the polarized armature which operates the bell. The rod 91 is provided with a depending portion which is bent outwardly and downwardly, as indicated at 93, to form a circuit-closing means arranged adjacent to the three  
 30 spring circuit-closers 94, 95, and 96, connected, respectively, to current-conducting wires 97, 98, and 99. The circuit-closers 94 and 95 are normally in contact with each other, while the spring-contact 96 is normally disengaged  
 35 from both. The spring 96 has an offset portion 96' arranged within the path of movement of the portion 93 of the arm, so that when the portion 92 of said arm is attracted on the closing of the circuit the depending  
 40 portion of the arm will be moved into engagement with the offset 96' and force the spring-contact 96 into engagement with the contact 94 and move contact 94 away from contact with the spring 95. The result of this operation  
 45 is to place the subscriber's transmitter and receiver in circuit with the main line—an operation which cannot under any circumstances be accomplished except by the operator at central, and then only by first operating  
 50 the selecting mechanism until the desired number is reached, the selecting mechanism closing the circuit through the magnets 80, causing the sounding of the call-bell and the movement of the rod 91 in the manner described,  
 55 so that when the subscriber removes his receiver from the hook he is connected to the line and can communicate with central or with any other subscriber which central has connected to the line.

60 The receiver-hook 101 is pivoted on a stud 102 in the usual manner and extends out through a suitable opening in the side of the switch-box for the reception of the receiver. In the receiver-hook bar is formed an opening  
 65 103 for the reception of the horizontal arm

104 of a vertically-disposed bar 105, guided in brackets projecting inwardly from the lid of the switch-box. The bar 105 is provided at its upper end with a spring 106, having an inclined forward edge and at its upper end  
 70 being bent laterally to form an inclined surface for engagement with a corresponding inclined surface at the end of an arm 93', projecting from the lower end of the depending portion 93 of the rod 91. The positions of  
 75 these parts are such that when the subscriber removes the receiver the receiver-hook will be forced up by the spring 107 in the usual manner, and the inclined upper end of the spring 106 will be forced over the inclined end of the  
 80 arm 93' until it reaches a point above said arm and is then slightly out of contact. If the conversation is finished and the subscriber replaces the receiver on the hook, the descending movement of the latter will cause the forwardly-inclined edge of the spring 106 to engage the arm 93' and force the latter outward,  
 85 causing the armature portion 92 of said arm to be raised to initial position or a point slightly above the line of the poles of the electromagnets 80, the arm being maintained in this position by engagement with the spring-contact 96, or an auxiliary spring or friction device of any desired character may be employed for the purpose. The replacing of the  
 90 receiver on the hook permits the contact 96 to move from engagement with the contact 94, and the latter then moves into engagement with the contact 95, the subscriber's talking-circuit being cut out and the parts restored  
 95 to initial position in readiness for a subsequent operation.

Before describing the arrangement of the circuits closed by the movement of the arm 91 I will first describe the construction and  
 105 arrangement of the mechanism whereby the subscriber is enabled to automatically signal his number to central by removing the receiver from its supporting-hook.

In the telephone switch-box is placed a  
 110 plate 110, formed of wood, vulcanized fiber, or other suitable non-conducting material and provided with a number of contact buttons or plates 111, the number being different in each phone and corresponding to the number designating the subscriber. In the present instance five of such contacts are shown, and each is independently connected to a wire 112,  
 115 leading to a binding-post 113, which is connected by a wire 114 to the main-line wire 1. The several contacts 111 are arranged in the arc of a circle, at the center of which is mounted the horizontal portion 115 of a switch-arm 116, said horizontal portion 115 passing through suitable guiding-openings in a bracket  
 120 117, which may be formed of stamped metal and secured in any suitable manner to the base-plate 110. The upper member of the switch-arm 116 is provided with a contact-plate 117', which engages all of the contacts  
 125 130



111 as it is moved in an arcuate line across the board, and the supporting-bracket, switch-arm, and contact 117 are all formed of conducting metal, the bracket being connected by a line-wire 118 to a hinge 119 and the circuit extending through a wire 98 to the intermediate spring-contact 95. When the contact 95 engages the contact 94, the circuit is completed through the wire 97, hinge 83, binding-post 82, wire 81, and wire 73 to main-line wire 2, and as this circuit includes the battery and indicating device at the central station the movement of the switch-arm across the series of contacts 111 will alternately close and open the circuit a number of times corresponding to the number of contacts 111, and the responsive indicating device at central will show the number of the calling subscriber.

To operate the switch-arm automatically, there is attached to the receiver-hook 101 a trackway 120, formed of a pair of spaced bars of any suitable material, the bars being bent at one end in such manner as to form a foot-piece for the passage of a securing pin or screw by which the track is secured to the receiver-hook, and each of the members of the track is provided with a guard 121. The track is centrally pivoted on a standard 120', arranged in the lower portion of the switch-box. Between the spaced members of the trackway fits a roller 122, formed of any material and provided with extended hubs 123, which rest on the trackways under the guard-wires 121, the latter preventing any upward movement of the roller. In one end of the hub is inserted a headed pin 124, which passes through a guiding slot or opening formed by bending the lower end of the switch-lever 116. The point of attachment between the receiver-hook and the trackway is at that end farthest from the pivot-point of the receiver-hook, and when the receiver is removed and the hook raised the trackway will be tilted in such manner as to cause the heavy roller 122 to travel in the direction of the pivot 102 of the receiver-hook, and thus cause the contact 117' to travel over all of the contacts 111, the final of the contacts 111 being somewhat broader than the rest and the contact 117' remaining in constant engagement therewith during all the time the receiver-hook is up, so as to keep the electromagnet of the indicating device at central energized and preventing another subscriber's calling central. It will be readily understood in this connection that as the electromagnet of the central indicating device must be deenergized before it can again become responsive to a call so long as a calling subscriber allows the hook to remain up and keeps the circuit closed the magnet of said indicating device will be energized, and it cannot be deenergized by any other subscriber.

The wiring of the local telephone may be that followed in ordinary practice, and the diagram illustrates a common method of connecting the receiver and transmitter, a local battery being introduced in the primary circuit, as usual.

When a subscriber wishes to call central, he removes his receiver from the hook, and as the latter moves up the contact 117' will ride over the several contacts 111, closing the circuit through the battery and indicator at central a number of times equal to the number of contacts. In answering the central operator closes the circuit by means of a key or other suitable device a number of times equal to the number of the subscriber's phone and the electromagnet 12 of the selecting mechanism is energized by the passage of a current from central battery, circuit-breaker, main-line wire 2, wire 73, binding-post 72, electromagnet 12, wire 29, binding-post 71, wire 29', to ground and from ground at central to battery. After the responsive movement of the selecting mechanism the depending bar 24 of the latter moves the contact 26 into engagement with the contact 28, and central now holding the circuit closed for a considerable period of time, the entering current is divided at the binding-post 72, a portion passing as before through the selecting-magnet 12 of the described circuit to ground, while another portion of the current passes through the wire 81, binding-post 82, hinge 83, wire 84, electromagnet 80, wire 85, hinge 86, wire 87, binding-post 88, wire 89, binding-post 70, wire 27, contacts 26 and 28, wire 29, binding-post 71, wire 29', to ground and from ground at central to central battery, thus energizing the subscriber's call-bell.

When the subscriber's call-bell is energized, the armature portion 92 of the rod 91 is drawn down and the depending portion 93 of said arm engages the offset portion 96' of the spring-contact 96, forcing the latter into engagement with the contact 94 and moving the contact 94 from engagement with the contact 95. I now have a circuit extending from central through wire 2, wire 73, binding-post 72, wire 81, binding-post 82, hinge 83, wire 97, contact 94, contact 96, wire 99, to a hinge 130 and thence to receiver-hook switch 101, wire 132, to the secondary of the local circuit, the receiver and wire 133, to binding-post 113, wire 114, to the main-line wire 1, and return to central, or in case central has connected another subscriber in the line the two connected subscribers may communicate with each other.

The remaining portion of the local system may be traced from local battery to transmitter, the primary coil of the inductorium, wire 132, to receiver-hook switch 101, and return to battery.

It will be seen that under no circumstances can a subscriber connect his talking-circuit to



the main line and is wholly dependent on central for this connection, thus preventing another subscriber from listening to a conversation being carried on, while at the same time a subscriber is prevented from signaling to central after another subscriber has called and before central has answered, thus making it absolutely necessary for central to answer calls in the order of their reception.

Having thus described the invention, what is claimed is—

1. In telephony, a system comprising a central station and main lines connected thereto, a plurality of local stations including each a transmitter, a receiver, and a call-bell, all normally disconnected from the main line, means controlled by the energizing of the call-bell magnets for placing the talking-circuit in communication with the main line, and a selecting means normally connected in the main line and provided with means for closing the circuit through the electromagnets of the call-bell.

2. In telephony, a system comprising a central station, and main lines, a plurality of local stations each including a transmitter, a receiver, and a call-bell, the transmitter and receiver being normally cut out of the main line, means under the control of the magnets of the call-bell for placing the talking-circuit in communication with the main line, and a selecting means in constant communication with the main line and controlling the energizing of the call-bell magnets.

3. In telephony, a central station, a main line, a selecting means disposed at each local station and normally in circuit with the main line, a normally cut-out local talking-circuit at each station, a normally cut-out signaling means at each station, said devices being arranged to constitute a serial circuit-closing means in which the selecting mechanism controls the circuit of the signaling means and the signaling means controls the talking-circuit.

4. In telephony, the combination with a main line and a plurality of stations, of a serial circuit-closing means comprising a selecting mechanism, an electromagnetic call-bell, receiving and transmitting instruments included in a normally cut-out talking-circuit, means controlled by the selecting mechanism for closing the circuit through the magnets of the call-bell, and means operable by the energizing of the call-bell magnets for placing the talking-circuit in communication with the main line.

5. In combination, a main line, and a plurality of local stations connected thereto, each of the local stations comprising a selecting mechanism in constant communication with the main line and provided with a circuit-closing means, an electromagnetic call-bell normally disconnected from the main line and connected thereto by the circuit-closing means

of the selecting mechanism, the magnets of the bell controlling a second circuit-closing means, and a normally disconnected talking-circuit under the control of said second circuit-closing means, whereby the selecting mechanism and the call-bell magnets must first be energized before the talking-circuit can be placed in communication with the main line.

6. In telephony, a central station and a main line, a plurality of local stations connected to the main line, a selecting mechanism arranged at each local station and normally connected through ground to the central station, an electromagnetic call-bell disposed at each local station and normally cut out of the main line, a circuit-closing means under the control of the selecting mechanism for placing the magnets and the call-bell in communication with said main line, a normally cut-out local talking-circuit, and means under the control of the electromagnet of the bell for placing the talking-circuit in communication with the main line.

7. In telephony, a central station, a main line and a plurality of local stations connected to the main line, an electromagnetic call-bell at each of the local stations, a normally cut-out local talking-circuit, means under the control of the bell-electromagnets for placing said talking-circuit in communication with the main line, and means controlled by the receiver-hook for restoring said circuit-closing means to initial position.

8. In telephony, a central station, a main line and a plurality of local stations connected to the main line, an electromagnetic call-bell at each station, a selecting mechanism for controlling the operation of said call-bell, a normally cut-out local talking-circuit, a circuit-closing means under the control of the bell-electromagnets for placing the local talking-circuits in communication with the main line, and means controlled by the receiver-hook for restoring said circuit-closing means to initial position.

9. In telephony, a central station, a main line and a plurality of local stations on the main line, an electromagnetic call-bell at each local station, a selecting means for controlling the operation of the call-bell, a normally cut-out local talking-circuit, a circuit-closing means for placing said talking-circuit in communication with the main line, and a pivotally-mounted bar adapted to engage said circuit-closing means, said bar having an armature arranged within the field of force of the bell-electromagnets thereby to permit the simultaneous sounding of the call-bell and the connection of the local talking-circuit with the main line.

10. In telephony, a central station, a main line and a plurality of local stations connected to the main line, an electromagnetic call-bell at each local station, a selecting means controlling the operation of said call-bell, a nor-



5 mally cut-out local talking-circuit, a circuit-closing device for placing the talking-circuit in communication with the main line, a pivotally-mounted bar adapted to engage the circuit-closing means, said bar having an armature arranged within the field of force of the electromagnets, and means controlled by the movement of the receiver-hook for restoring the bar to initial position and thus cutting out  
10 the local talking-circuit.

11. In telephony, a receiver-hook-actuated signaling mechanism comprising an oscillatory track, a member carried thereby and movable by gravity from end to end of the track, a plurality of stationary contacts connected to the signaling-circuit, and a movable contact operatively connected to said movable member and adapted to engage all of the contacts on the removal of the receiver from the  
20 hook.

12. In telephony, a receiver-hook-actuated signaling device comprising a pivoted track connected to the receiver-hook, a plurality of contacts connected to the signaling-circuit, a roller mounted on the track and movable by gravity from end to end thereof, and a movable contact operatively connected to the roller and adapted to engage the several contacts when the receiver is removed from the  
30 hook.

13. In telephony, a receiver-hook-actuated signaling device comprising a pivotally-mounted track connected to and movable with the receiver-hook, a roller mounted on the track and movable by gravity from end to end thereof, a plurality of spaced contacts connected to the signaling-circuit, a movable contact, a pivotally-mounted arm carrying said movable contact and adapted to traverse the  
35 latter over the spaced contacts, and means connecting said pivotally-mounted arm to the roller.

14. In telephony, a receiver-hook-actuated signaling device comprising a pivoted track, a roller mounted on the track and movable by gravity from end to end thereof, an angularly-bent arm having a horizontally-disposed portion, a bearing or support with which the horizontally-disposed portion of said arm engages, a spring-contact carried by said arm, and a plurality of spaced contacts connected to the signaling-circuit and with which said movable contact engages on the removal of the receiver from the hook.  
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15. In telephony, a receiver-hook-actuated mechanism comprising a pivoted trackway formed of a pair of spaced parallel bars, a roller having extended hub portions mounted on said bars, a bracket having bearing-openings, an angularly-bent arm having a horizontal portion passing through said openings,  
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the lower portion of said arm being bent to form an elongated slot or recess, a pin projecting from the roller and engaging said slotted portion or recess, a spring-contact carried by the upper portion of the arm, and a plurality of spaced contacts connected in the signaling-circuit and with which said spring-contact engages on the removal of the receiver from the hook. 65

16. In telephony, a receiver-hook-actuated signaling device comprising a plurality of spaced contacts connected to the signaling-circuit, there being in each of the local stations contacts of different number to permit the automatic signaling of the number of the station to central, the last of said contacts at each station having a greater surface area than the remainder, and a movable contact actuated by the upward movement of the receiver-hook and adapted to engage successively all of said contacts. 70

17. In telephony, the combination with an electromagnetically-operated call-bell, a pivotally-mounted arm having an armature disposed within the field of force of the electromagnets, a plurality of spring-contacts adapted to be engaged by the arm and connected partly in the signaling and partly in the talking circuits, the lower end of said arm terminating in an inclined shoulder, a vertically-movable bar connected to the receiver-hook, and a spring-tongue carried at the upper end of the bar and having a cam-face for engaging the lower portion of the arm and returning the same to initial position. 85

18. In telephony, the combination with an electromagnetically-operated call-bell, of a pivotally-mounted arm having an armature arranged within the field of force of the electromagnet, a plurality of spring-contacts adapted to be engaged by the arm and connected partly in the signaling and partly in the talking circuit, the lower end of said arm having a horizontally-disposed portion terminating in an inclined shoulder, a vertically-movable bar operatively connected to the receiver-hook, and a spring-tongue secured to the upper end of said bar, the upper portion of the tongue being inclined to engage the inclined shoulder of the arm and the forward face of said tongue forming a cam for engaging with and restoring the arm to its initial position. 95

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses. 115

WILLIAM DAVID WATKINS.

Witnesses:

A. M. BAXTER,

LA VONE C. WILLIAMS.