

No. 686,207.

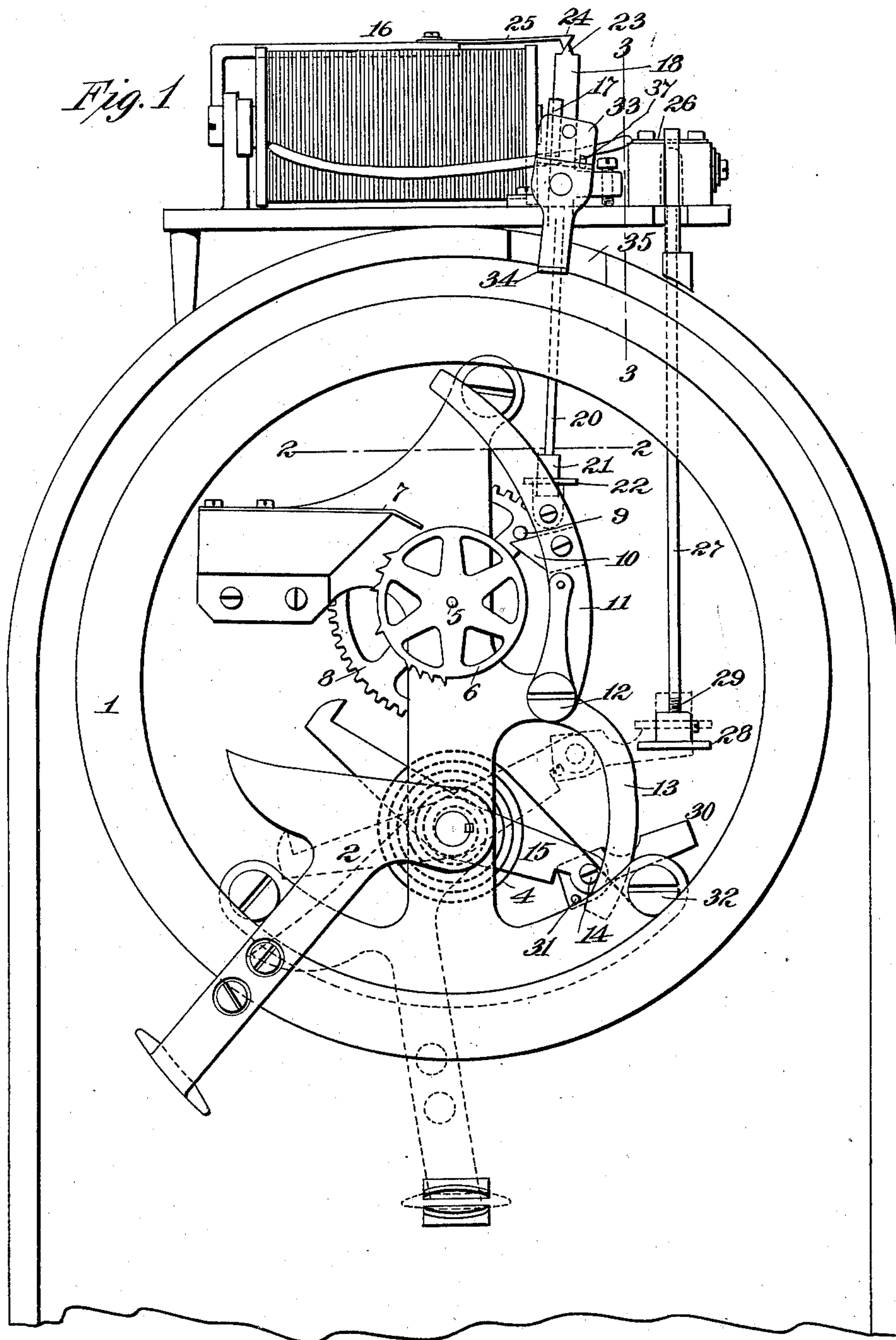
Patented Nov. 5, 1901.

C. W. CORNELL.  
AUXILIARY SIGNALING BOX.

(Application filed Mar. 22, 1900.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:

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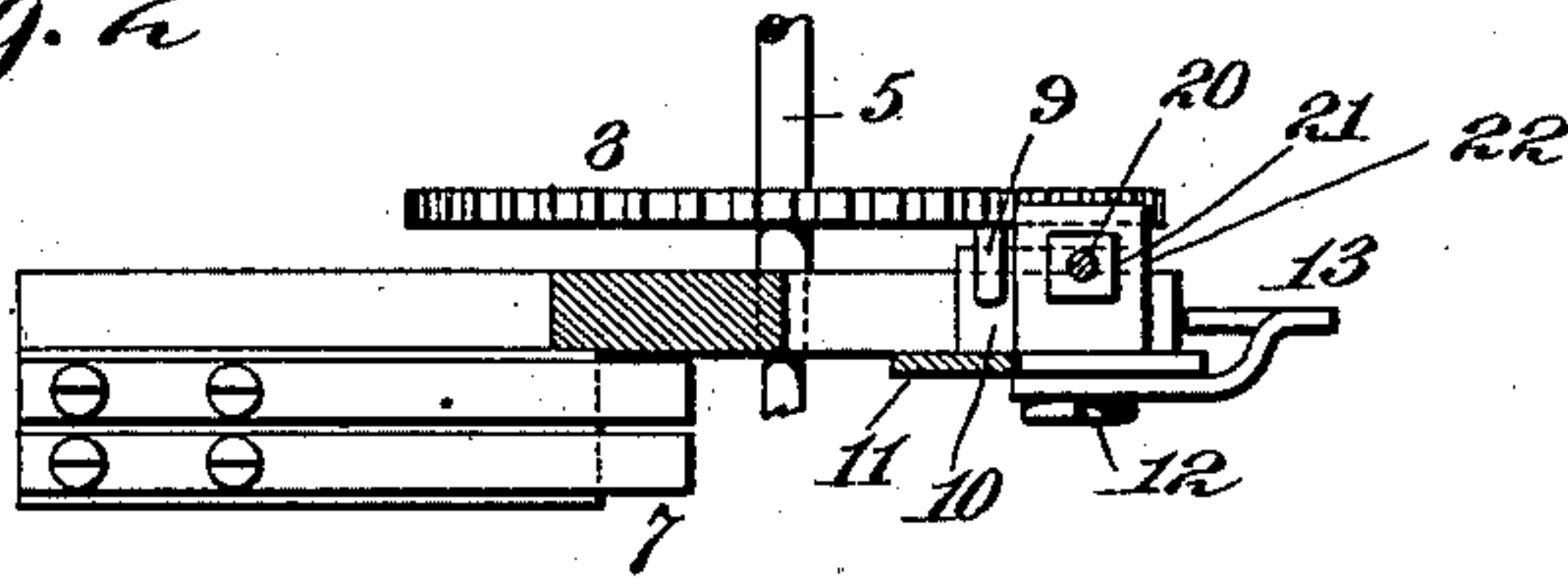
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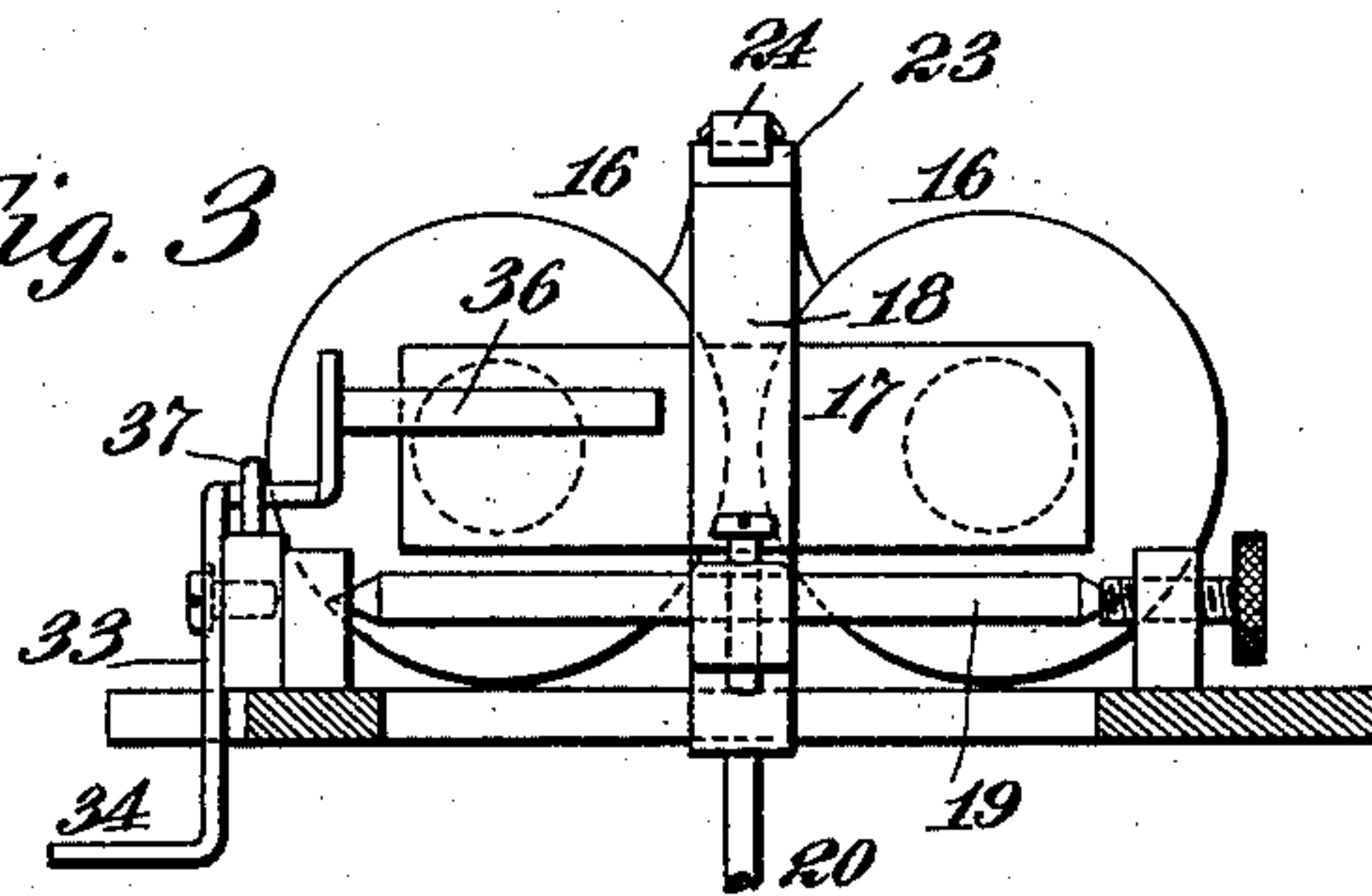
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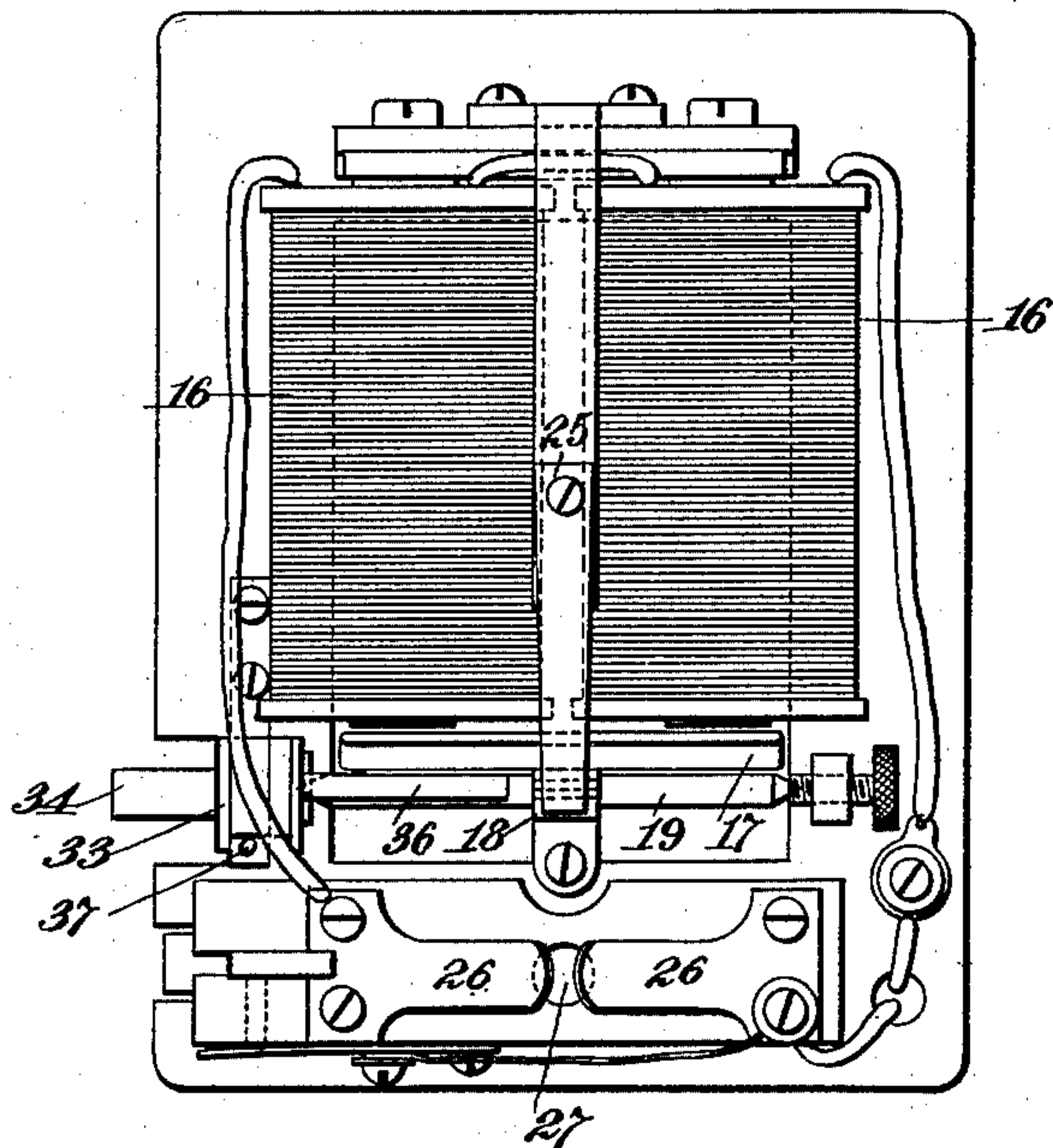
*Fig. 2*



*Fig. 3*



*Fig. 4*



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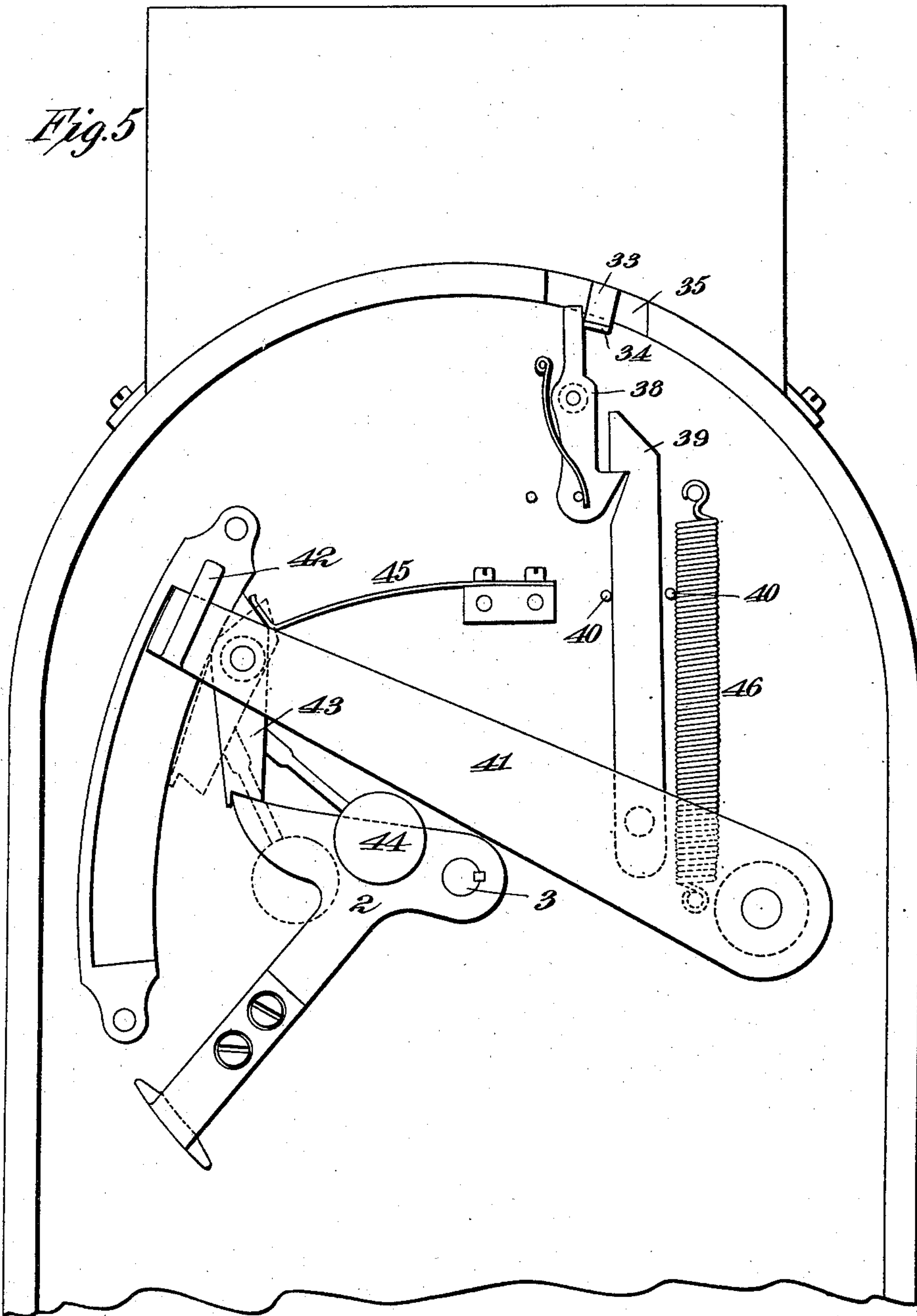
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(No Model.)

3 Sheets—Sheet 3.



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# UNITED STATES PATENT OFFICE.

CHARLES W. CORNELL, OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO THE  
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## AUXILIARY SIGNALING-BOX.

SPECIFICATION forming part of Letters Patent No. 686,207, dated November 5, 1901.

Application filed March 22, 1900. Serial No. 9,662. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES W. CORNELL, a citizen of the United States, residing at East Orange, county of Essex, and State of New Jersey, (and having my post-office address at No. 70 South Clinton street, Orange, New Jersey,) have invented certain new and useful Improvements in Auxiliary Signaling-Boxes, of which the following is a specification.

My invention relates to improvements in auxiliary signaling apparatus of the sector type. In boxes of this character the sending in of a signal requires to be preceded in each case by the winding up of the spring. Auxiliary apparatus has been before applied to boxes of this type and by which a box having been set or wound up may be operated from an auxiliary circuit leading to one or more auxiliary stations. The auxiliary appliances heretofore suggested for use with signaling-boxes of this type have been objectionable, partly because of the fact that the mechanism for starting the box is exposed and is of a delicate character and there was danger of its being tampered with or of an effort being made to start the box before winding it up. Because of this fact the sector-boxes which have heretofore been provided with auxiliary mechanism have been liable to derangement.

The object of my present invention is to improve the auxiliary mechanism for use in connection with sector-boxes by which the construction will be simplified and the objection noted overcome.

In order that my invention may be better understood, attention is directed to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a face view of a portion of the inner case of a sector-box with my present attachments, illustrating so much of the box mechanism as is necessary for an understanding of my present improvements; Fig. 2, a section on the line 2 2 of Fig. 1; Fig. 3, a section on the line 3 3 of Fig. 1 looking toward the left; Fig. 4, a plan view of the auxiliary

mechanism, and Fig. 5 a detail view of the box-operating devices which are carried on the door of the inner casing and which result in the winding up of the box and the setting of the box mechanism.

In all of the above views corresponding parts are represented by the same numerals of reference.

A cylindrical casing 1 is located within the usual inner case and carries the box mechanism, which in the present instance is of the sector type.

2 is a winding-lever keyed to a winding-shaft 3, to which is secured a spring 4. A movement downward of the lever 2 winds the spring 4, and the return movement of the lever results in the operation of the box mechanism. This mechanism is provided with the usual shaft 5, carrying the signaling-wheel 6, on which bear the contact-pens 7 in the signaling-circuit. The signal-shaft 5 carries a gear 8, by which it is driven, and on said gear is a stop-pin 9, into the path of which projects a tooth 10 to start and stop the box mechanism. The tooth 10 is carried on a lever 11, pivoted at 12 and carrying a curved lower extension 13. Coöperating with this extension is a pin 14, carried by a lever 15, which is keyed to the winding-shaft 3. When the spring is unwound and the lever 2 is in the position shown in full lines, Fig. 1, the pin 14 engages with the lower portion of the extremity 13 and maintains the tooth 10 locked in its position beneath the pin 9.

When the winding-lever 2 is moved downward to wind up the spring, as shown in dotted lines, the pin 14 will be withdrawn from the extension 13 and the tooth 10 will be held in engagement with the pin 9 by friction, so that the tooth may be withdrawn from that engagement to start the box.

With my present improvements the starting of the box is effected by the movement of an auxiliary armature whether the signal is sent from the box in the first instance or from an auxiliary station. Mounted upon the inner casing of the box and within the outer box are the auxiliary magnets 16, the arma-



ture 17 of which is carried on a lever 18, pivoted on the rock-shaft 19. An arm 20 extends downward from the lever 18 and carries an insulating-block 21 at its lower end, which  
 5 engages within a slotted head 22, carried by the lever 11. Normally the auxiliary circuit is closed on a weak battery, which is insufficient to result in the attraction of the armature 17 by the auxiliary magnets 16. By connecting additional batteries on the auxiliary  
 10 circuit, as is now the practice, the armature 17 will be attracted, swinging the lever 18 and withdrawing the tooth 10 from the pin 9, so as to allow the box to start. The upper end  
 15 of the lever 18 is provided with a tooth 23, with which a wedge 24, carried on a spring 25, engages, whereby the engagement of the wedge on one side of the tooth will hold the armature 17 normally retracted to prevent  
 20 accidental disengagement of the tooth 10 from the pin 9, while when the wedge 24 engages the opposite side of the tooth 23 the tooth 10 will be prevented from accidentally moving into the path of the pin 9 before the pin 14  
 25 results in the positive movement of the tooth 10 into the path of the pin 9 by its engagement with the inclined extension 13 of the lever 11.

It is the practice with auxiliary systems as  
 30 now installed to provide at each auxiliary station a trouble-bell, which is brought into operation by the breaking of the auxiliary circuit. The ringing of this bell therefore, as it is now used, notifies the auxiliary operator that the auxiliary circuit has been disabled, so that repairs thereof can be made.

With my present improvement I utilize the trouble-bell at the auxiliary station for the purpose of notifying the operator thereat that  
 40 an auxiliary signal has been received at and transmitted by the street-box, and I also utilize the trouble-bell for the purpose of offering a further notification to the operator at the auxiliary station when the street-box has  
 45 been operated by directly pulling the box or from another auxiliary station. Thus when an alarm has been sent in by an operator at an auxiliary station he will be advised immediately of the transmission of the signal from  
 50 the street-box, while if the trouble-bell commences to operate at other times the operator at the auxiliary station will know either that his particular auxiliary circuit has been disabled or that the street-box has been pulled,  
 55 but has not been reset. In either instance the condition of the street-box or of the auxiliary circuit requires attention. The operator at the auxiliary station will be enabled to determine by the continuous operation of his trouble-bell whether that attention has been given to the box or to the circuit. In order that these objects may be effected, I utilize a pair of contact-springs 26 26, the break between which is adapted to be bridged  
 65 normally by the upper end of a rod 27. The springs 26 are included in the auxiliary cir-

cuit, and when that circuit is in its normal closed condition the upper end of the rod 27 will be elevated. The rod 27 leads down to the case 1 and is provided at its lower end  
 70 with a head 28, adjustable on the threads 29 and adapted to be engaged by an arm 30, pivoted to the end of the lever 15. A pin 31, carried by the arm 30 beyond its pivot, engages the under side of the lever 15 when the  
 75 winding-shaft is turned, so that the arm 30 will act practically as an extension of the lever 15 at the right of its pivot and will engage beneath the head 28 of the rod 27 to elevate the latter and close the auxiliary circuit at the springs 26 26. As the winding-shaft returns to elevate the end of the lever  
 80 2 the arm 30 will be withdrawn from the rod 27 to allow the latter to break the auxiliary circuit at the springs 26, and said arm will descend until it engages one of the cross-bars 32 of the box mechanism to prevent further movement of the said arm, which then moves  
 85 relatively to the lever 15. This construction effects a greater saving of space within the inner case 1 than would be secured if the arm 30 were rigidly secured or integrally formed with the lever 15, as will be obvious. In order to operate the box mechanism at the box  
 90 itself, I pivot a lever 33, having an outturned finger 34, which is located within a slot or recess 35, formed in the inner casing. The lever 33 carries a rod 36, which engages the front of the armature 17, so that when the  
 95 finger 34 is moved to the right in Fig. 1 the armature 17 will be moved toward the magnet to trip the box, as explained. The return movement of the lever 33 is limited by a pin 37, which engages the said lever, as shown. The cover of the inner box carries  
 100 a lever 38, pivoted on its inner face and with its upper end working in the recess 35, so as to engage the finger 34 of the lever 33 when the lever 38 is actuated. The lever 38 is engaged by a hook 39, which slides between two  
 105 pins 40 40 on the cover and which is connected at its lower end to a lever 41, to which the hook 42 is secured. This hook projects through a slot in the cover of the inner casing and is adapted to be pulled down by  
 110 hand. Pivoted to the lever 41 is a gravity-pawl 43, carrying a weight 44, which normally tends to throw the pawl into the position shown in dotted lines, Fig. 5. The lower end of the pawl 43 is adapted to engage with the  
 115 end of the lever 2, and these parts are maintained in that engagement by friction during the descent of the hook 42 in the pulling of the box. A spring 45 engages the upper end of the pawl 44, when the lever 41 is returned  
 120 to its normal position by a spring 46 to throw the pawl 43 in the position shown in full lines, Fig. 5, and to thereby engage the outer end of the lever 2. By reason of this construction the pawl 43 can only engage the end of  
 125 the lever 2 when the lever 41 is elevated to its normal position and when the lever 2 has



been returned by the unwinding of the spring and the sending in of the signal, since at this point the pawl and the lever 2 are capable of engagement. By reason of this construction it becomes impossible, therefore, to depress the lever 2 by pulling down the hook during the sending in of a signal, and the operator is required to wait until the signal has been sent in before the signal can be repeated.

The operation of the box will be as follows: Normally the parts occupy the position shown in dotted lines, Fig. 1, with the spring wound and the arm 30 engaging beneath the head 28 to elevate the rod 27 and close the auxiliary circuit at the springs 26. The tooth 10 is in engagement beneath pin 9, which locks the box mechanism. The wedge 24 is on the left side of the tooth 23, and the armature 17 is in a retracted position. The auxiliary circuit is normally closed on a weak battery, which is insufficient to result in the tripping of the box, but is sufficient to prevent the sounding of the trouble-bell. If an alarm is to be sent in at the said station, the hook 42 is pulled down. Assuming the box to be wound, the pawl 43 will not engage the lever 2, since the lever will be depressed; but the movement downward of the lever 41 will depress the hook 39, which, working between the pins 40, cannot follow the swing of the lever 38, but will be disengaged from said lever near the start in the movement of the hook. The short movement which is thus imparted to the lever 38 will move the lever 33, swinging the armature 17 toward the auxiliary magnets and withdrawing the tooth 10 from the pin 9, thus allowing the box mechanism to start. Ordinarily the signaling-shaft 5 makes three or four complete rotations. Near the end of the signaling operation the pin 14, which moves downward as the winding-lever 2 ascends, will engage the extension 13 of the lever 12 and return the tooth 10 again into the path of the pin 9, which will once more engage the said pin and bring the box mechanism to rest. This resetting also retracts the armature 17 to its original position. Immediately after the box mechanism starts and the winding-lever 2 has commenced to ascend the arm 30 will permit the rod 27 to be withdrawn from contact with the spring 26 to break the auxiliary circuit, thus informing the operator at each auxiliary station that the street-box has been operated. The trouble-bell at each auxiliary station will therefore sound so long as the street-box remains unwound. By depressing the lever 2 to wind up the street-box the arm 30 will engage beneath the rod 27 to again close the auxiliary circuit at the contacts 26, thus stopping the operation of the trouble-bell. When the signal is to be sent in at the street-box from an auxiliary station, the closing of the auxiliary circuit upon the additional batteries, as is common, will result in

the attraction of the armature 17 to withdraw the tooth 10 from the pin 9, allowing the box to start. Immediately after the box has commenced to operate, or as soon, therefore, as may be desired, by properly proportioning the parts the auxiliary circuit will be broken at the contacts 26 and the sounding of the trouble-bell will therefore immediately notify the operator that the signal has been received and is being actually transmitted. The trouble-bell will sound, therefore, until the box has been again wound ready for the reception of another signal.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows:

1. In a signaling-box of the sector type, the combination with the street-box mechanism, of a lever controlling the starting and stopping thereof, a pin operated by the winding-spring for restoring said lever, an auxiliary magnet the armature of which connects with said lever to allow the box mechanism to start, a starting-lever for moving the armature, and means for winding the operating-spring and simultaneously operating the starting-lever, substantially as set forth.

2. In a signaling-box of the sector type, the combination with a street-box mechanism, of a lever controlling the starting and stopping thereof, a pin operated by the winding-spring for restoring said lever, an auxiliary magnet the armature of which connects with said lever to allow the box mechanism to start, a starting-lever for moving the armature, a pair of contacts in circuit with the auxiliary magnet, and means for breaking the auxiliary circuit at said contacts upon the starting of the box mechanism, substantially as set forth.

3. In a signaling-box of the sector type, the combination with a street-box mechanism, of a lever controlling the starting and stopping thereof, a pin operated by the winding-spring for restoring said lever, an auxiliary magnet the armature of which connects with said lever to allow the box mechanism to start, a starting-lever for moving the armature, a pair of contacts in circuit with the auxiliary magnet, and means for breaking the auxiliary circuit at said contacts upon the starting of the box mechanism and for restoring the auxiliary magnet-circuit upon the winding of the box, substantially as set forth.

4. In a signaling-box of the sector type, the combination with a street-box mechanism, a lever controlling the starting and stopping thereof, a pin movable with the spring-shaft for restoring said lever, an auxiliary magnet, the armature of which connects with said lever to allow the box mechanism to start, a starting-lever for moving the armature, a hook-lever engaging the starting-lever, and a box-pawl for operating the hook-lever, substantially as set forth.

5. In a signaling-box of the sector type, the



combination with a street-box mechanism, a lever controlling the starting and stopping thereof, a pin movable with the spring-shaft for restoring said lever, an auxiliary magnet, 5 the armature of which connects with said lever to allow the box mechanism to start, a starting-lever for moving the armature, a hook-lever engaging the starting-lever, a hook engaging the hook-lever, and a box-

pawl for operating the said hook, substantially as set forth.

This specification signed and witnessed this 16th day of March, 1900.

CHAS. W. CORNELL.

Witnesses:

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ROY BENEDICT.