

No. 695,976.

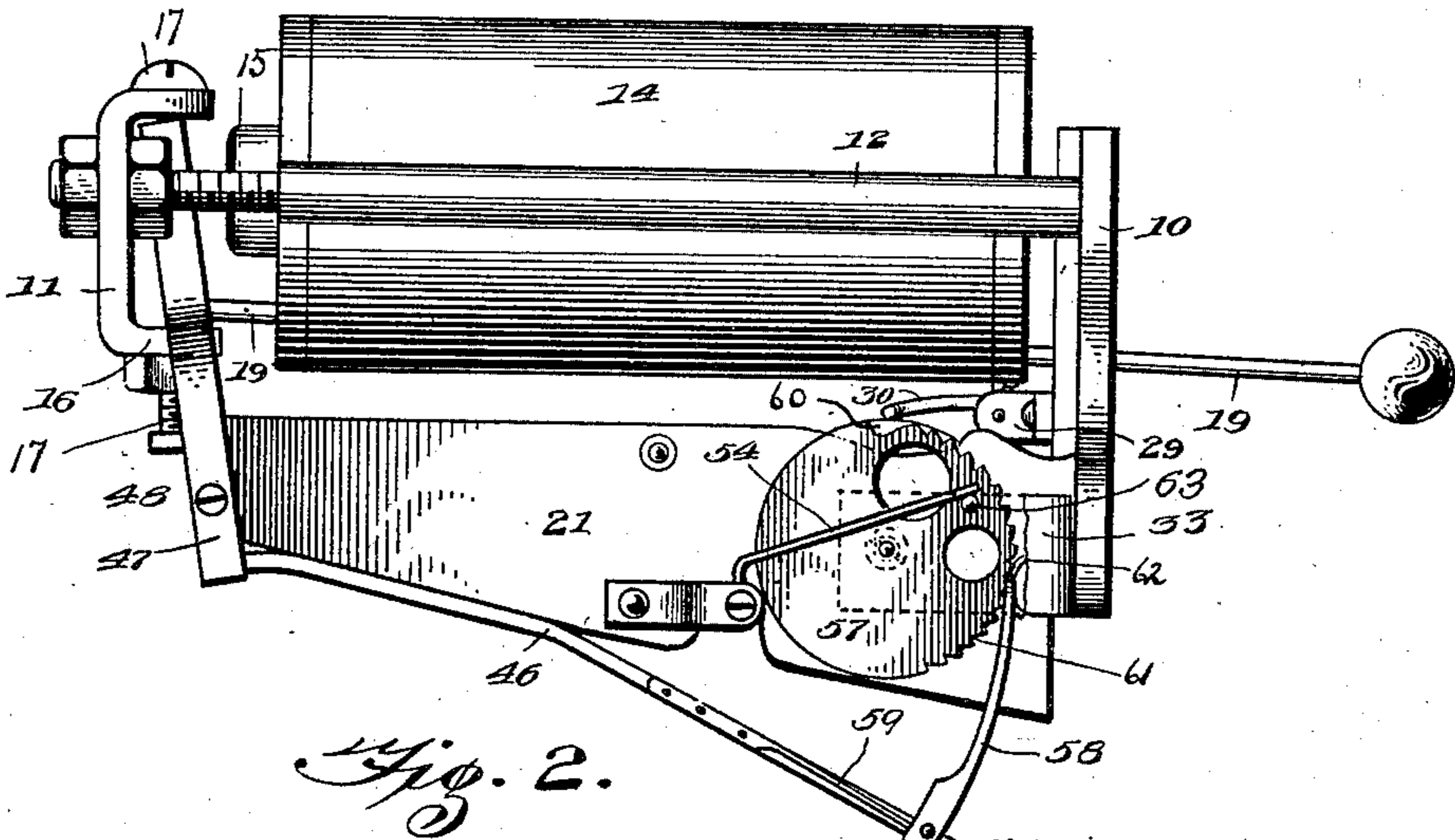
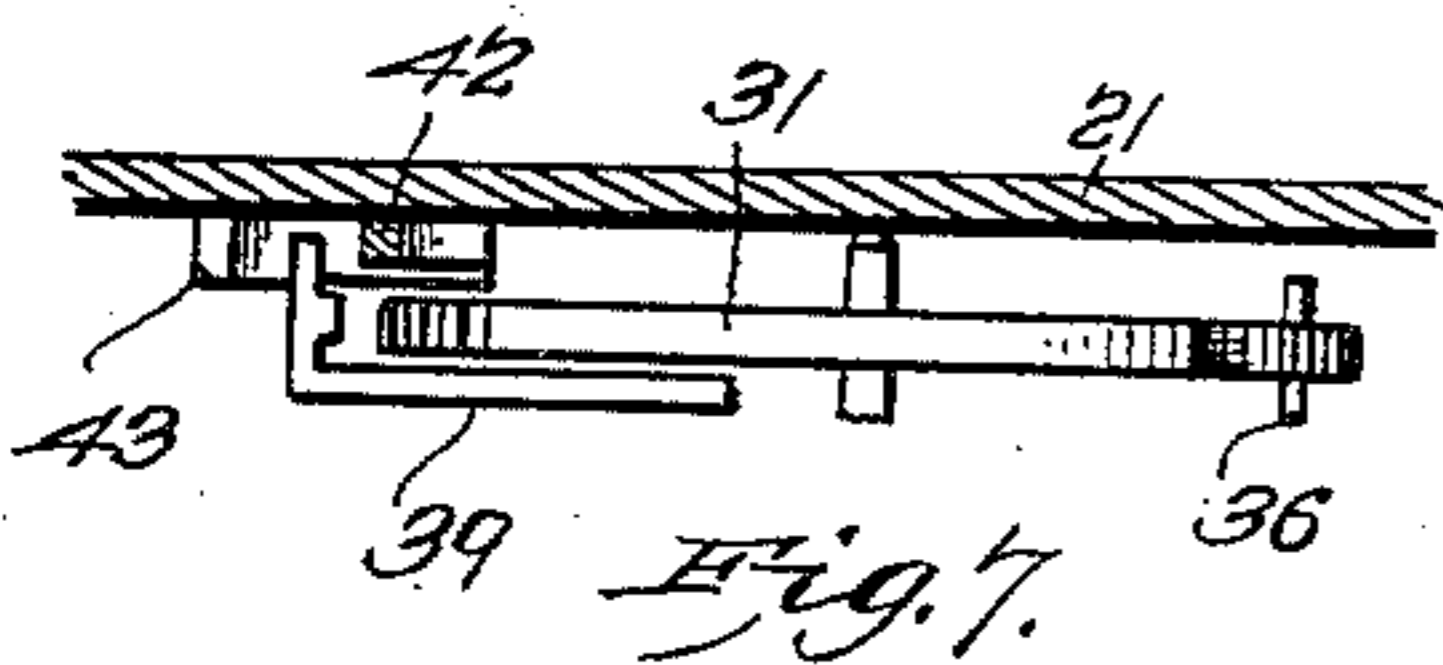
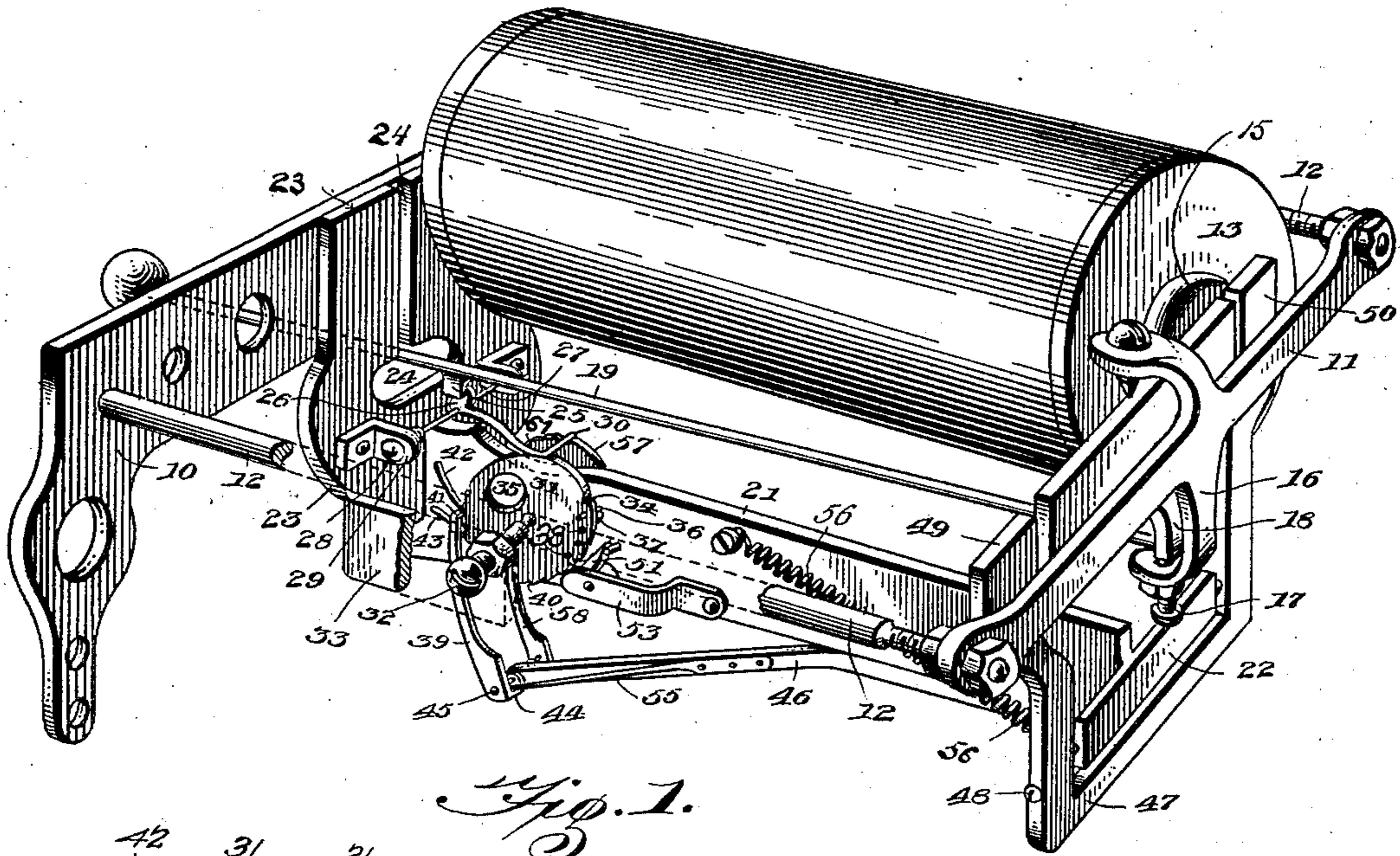
Patented Mar. 25, 1902.

W. D. WATKINS.  
TELEPHONE SELECTING DEVICE.

(Application filed May 11, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses  
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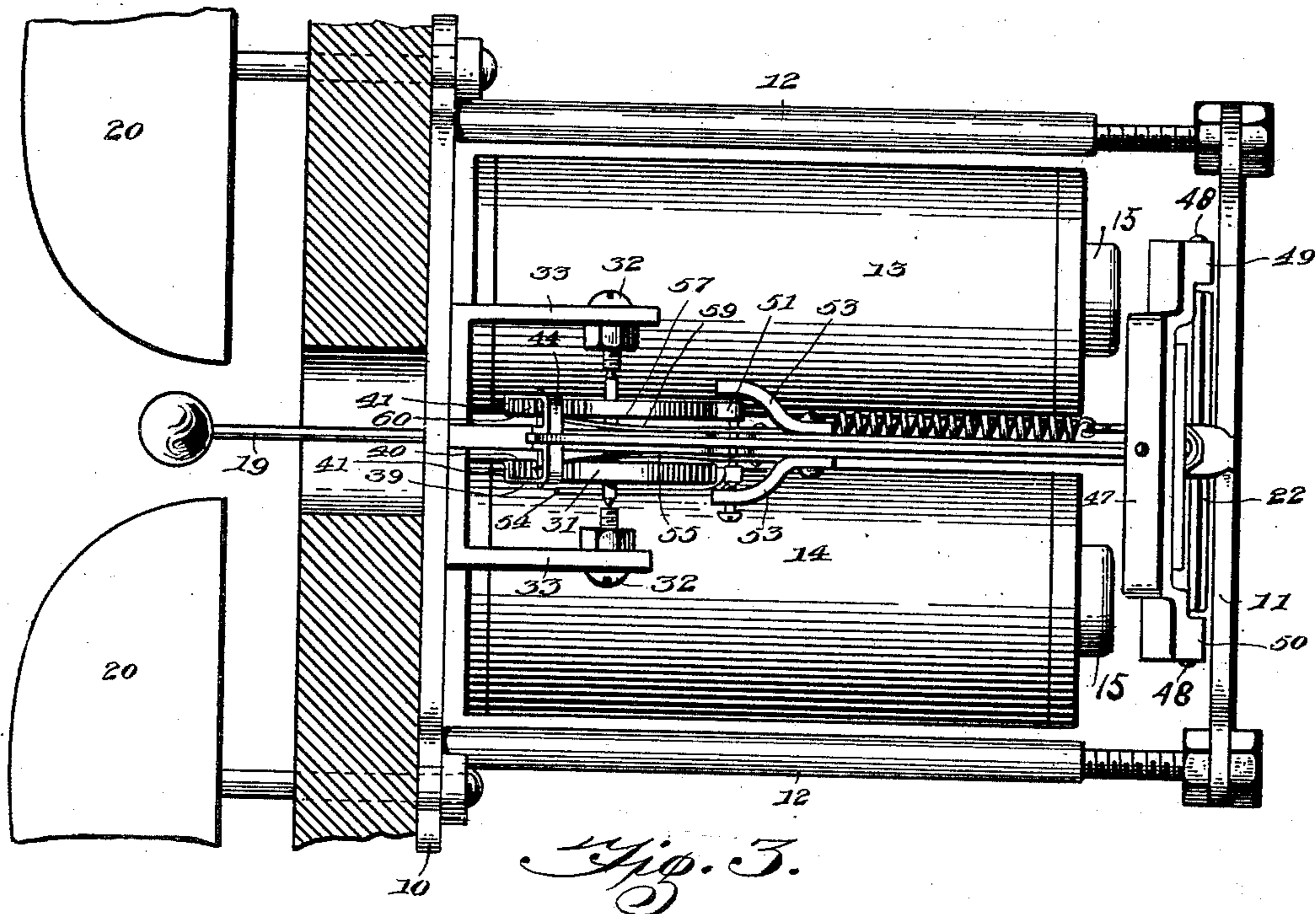


Fig. 3.

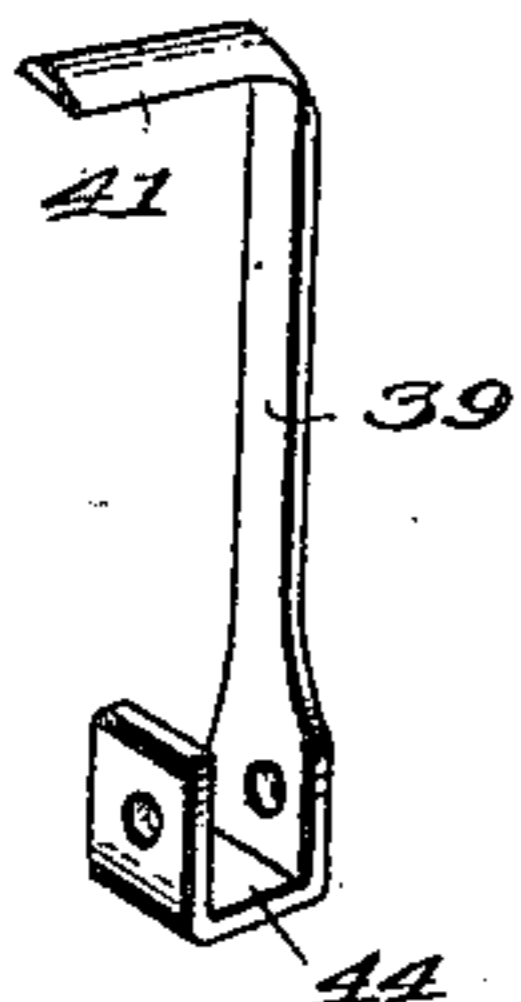


Fig. 4.

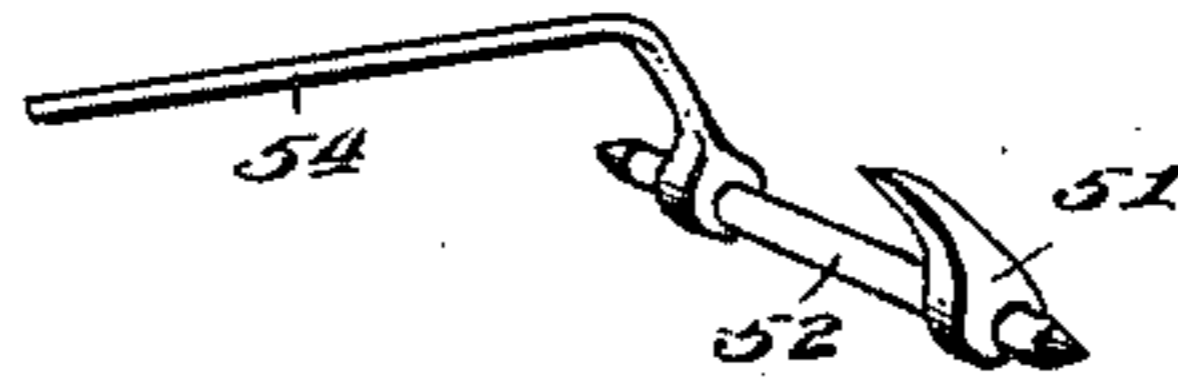


Fig. 5.

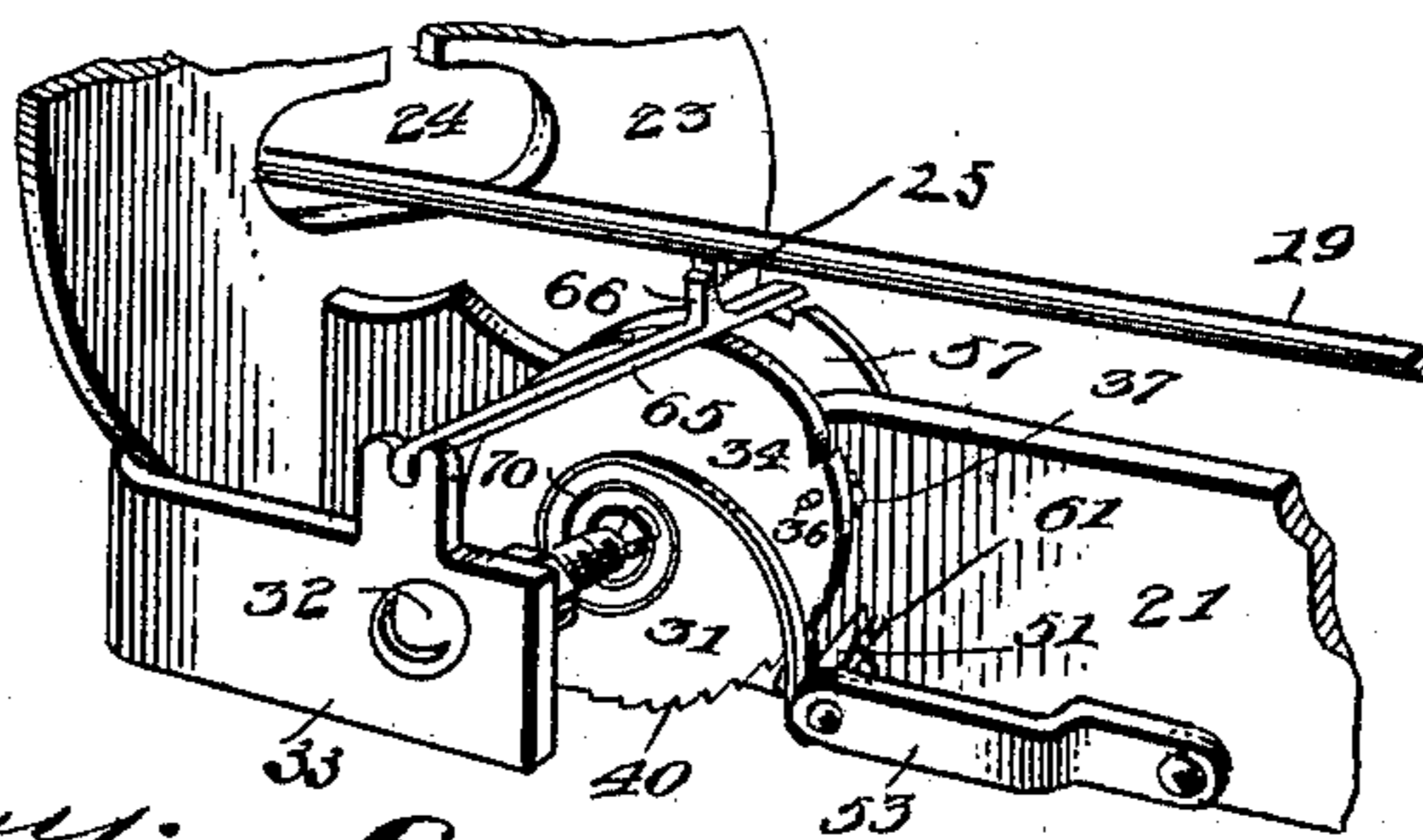


Fig. 6.

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# UNITED STATES PATENT OFFICE.

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## TELEPHONE-SELECTING DEVICE.

SPECIFICATION forming part of Letters Patent No. 695,976, dated March 25, 1902.

Application filed May 11, 1901. Serial No. 59,858. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM D. 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 Device, of which the following is a specification.

This invention relates to devices for use in telephony or similar systems wherein a number of subscribers are on a single line and where it is desired to ring up a certain subscriber without sounding the bell of any other subscriber, it being understood, of course, that the specific mechanism may be used without any other communicating instruments, as where it is desired to send a signal having a predetermined interpretation.

The object of the invention is to provide in connection with a common form of telephone signal-bell operable by electrical currents a locking device for holding the clapper normally locked against vibration and which lock will be released through the medium of the bell-magnets and connected mechanism and in response to a predetermined number of intermittent currents.

A further object of the invention is to provide means whereby when the locking mechanism is operated to release the clapper the final intermittent current may be continued to sound the bell and when discontinued the parts will resume their normal positions to lock the clapper.

Other objects and advantages of the invention will be understood from the following description.

In the drawings forming a portion of this specification, and in which like numerals of reference indicate similar parts in the several views, Figure 1 is a perspective view showing the mechanism for locking and releasing the clapper, one of the braces of the frame being broken away and one of the magnet-coils being removed to show the structure more clearly. Fig. 2 is a side elevation of the mechanism looking in the opposite direction from that of Fig. 1, the mechanism, as in Fig. 1, being in locked position. Fig. 3 is a bottom plan view of the mechanism. Fig. 4 is a detail view showing one of the rotating pawls. Fig. 5 is a detail view of the retaining-pawl and its

shaft and arm. Fig. 6 shows a modification of tumbler and means for holding the disks yieldably in normal positions. Fig. 7 is a detail view of a portion of the ratchet-disk-operating mechanism.

Referring now to the drawings, there is shown the mechanism of a common form of telephone-bell, including a frame comprising end plates 10 and 11, having connecting-braces 12, and upon which plate 10 are mounted the two coils 13 and 14 of the bell-magnet, the poles 15 of which are spaced inwardly from the plate 11. The plate 11 has the laterally-extending arms 16, in which are engaged the pivot-screws 17, which pivotally support the armature 18. The armature 18 is polarized and carries the bell-clapper 19, which extends through the plate 10 and in operative relation to the bells 20. The present invention is an attachment for this mechanism which may be readily applied and removed; and it consists of the plate 21, having the head 22 and the foot 23 at opposite ends thereof and projecting at right angles therefrom, the foot-plate 23 being disposed against the inner face of plate 10, to which it is firmly belted. The foot 23 is provided with the T-shaped slot 24, through the stem of which the bell-clapper is introduced and in the head of which it is adapted to vibrate, as will be understood upon reference to Fig. 1 of the drawings.

The clapper 19 is provided with a locking-lug 25, which projects downwardly therefrom, and in the path of this lug, as the clapper tends to vibrate, is a locking-tumbler 26, carried by the shaft 27, which is pivoted between the screws 28, engaged in the blocks 29 on the plate or foot 23. When this tumbler is in the path of the locking-lug, the clapper is held from vibration, and when the tumbler moves from the path of the lug the clapper may vibrate under the influence of electrical currents passed through the windings of the magnet. The tumbler is provided with a rearwardly-directed arm 30, the free end of which is bent laterally at right angles and lies normally upon and transversely of the periphery of a disk or wheel 31, which is delicately journaled between a bearing-screw 32 and the adjacent side of the plate 21, the bearing-screw

being adjustably engaged with an ear 33, formed by bending a projecting portion of the foot-plate 23 rearwardly to lie parallel with plate 21.

5 The disk 31 has a notch 34 therein to receive the end of the tumbler-arm when the disk is moved to the proper position, so that the tumbler may be permitted to move under the influence of the weight of the arm to release the locking-lug of the clapper, the disk being held normally in position with this notch out of operative position by shifting the center of gravity of the disk near to the notch, so that this portion of the disk will hang normally downwardly. This result is secured by boring the disk, as shown at 35, to reduce the weight at this point. The disk is held, however, with the notch a predetermined angular distance from the end of the tumbler-arm by means of a stop-pin 36, which is engaged with the disk and is adapted to strike a stop block or lug 37 on the side of the plate 21, there being a number of perforations 38 in the disk, so that the stop-pin may be shifted angularly of the disk to stop the disk at different positions, so that the notch may lie at different angular distances from the tumbler-arm, depending upon conditions of operation to be hereinafter described.

30 To rotate the disk 31 from its normal or locked position to its releasing position, a pawl 39 is provided for engagement with a series of ratchet-teeth 40, formed upon one portion of the periphery of the disk, and this pawl has a laterally-bent engaging portion 41, which operates between the two guide-strips 42 and 43 upon the plate 21 and which are disposed convergingly and at an angle to the direction in which the pawl tends to move under the influence of its operating mechanism hereinafter described, so that as the pawl is moved in its forward position it will strike the strip 42, which will guide it from the ratchet-teeth, and when the pawl is drawn in the opposite direction and has engaged a ratchet-tooth it will strike the strip 43 when it has moved to advance the disk one tooth. These strips are simply small curved guides which act to direct the pawl toward and from the teeth, and thus provide for positively moving the pawl from the ratchet-teeth and for limiting the movement of the pawl, so that the disk can be advanced only one tooth. This is to prevent excessive rotation due to sudden movement of the pawl. The opposite end of the pawl is bent into hook shape, as shown at 44, in the sides of which are bearing-perforations to receive a pin 45, projecting laterally from a lever 46, attached to a U-shaped armature 47, having pivot-screws 48 engaged therewith and with depressions in the end of the head-plate 22, the ends of the arms 49 and 50 of this armature lying in close proximity to the ends of the poles of the electromagnet and being of soft iron, so that when the magnet is energized even by an alternating current the armature will be moved or attracted and

held in attracted position so long as the energization continues. Thus if a series of electrical impulses or intermittent currents, 70 either continuous or alternating, be passed through the electromagnet the armature will be attracted a corresponding number of times, and if a proper number of pulsations be sent through the disk 31 will be advanced a sufficient number of steps to carry the notch thereof into position to receive the tumbler-arm, so that the tumbler may move to release the locking-lug of the clapper, the disk being held against return movement during retraction of the rotating pawl by means of a retaining-pawl 51, mounted upon a rock-shaft 52, mounted in supports 53, and to which shaft is also secured an arm or lever 54, extending at the opposite side of the plate 21 85 from the pawl and the weight of which holds the retaining-pawl normally and yieldably in engaging position.

The rotating pawl is held up to active position by means of a spring-finger 55, secured 90 to the lever 46 and engaged in the bight of the hook of the pawl, while the armature 47 is returned when released by means of a helical spring 56, attached thereto and to the side of the plate 21. 95

As above stated, the position of the stop-pin determines the angular movement of the disk necessary to release the tumbler-arm, and consequently the number of movements of the rotating pawl necessary to bring the disk, with the notch, into active position. 100 Supposing that in the present instance a circuit, including the magnet, must be closed on a source of electricity ten times to move the disk to its releasing position, on the tenth closure of the circuit the tumbler will move to release the clapper, and if the circuit be held closed the continued energization of the magnet will effect a vibration of the clapper in the usual manner, it being understood that 110 the current employed is an alternating current from a magneto. Thus the bell will not ring until the operating-circuit has been closed ten times, and when the circuit is finally broken if the retaining-pawl be raised 115 the disk will return to its former position, being also released by the rotating pawl, which by striking against the guide-strip 42 is moved thereby from engagement with the teeth of the disk. 120

In practice a number of these mechanisms are connected in series in a single line, each instrument requiring a different number of pulsations to actuate it to unlock or release the bell-clapper, and supposing there is in 125 the system an instrument requiring fifteen pulsations to actuate it there must be provided some means for preventing operation of other mechanisms operated from a lesser number of pulsations when the corresponding numbers of pulsations are given. Also means must be provided for moving the retaining-pawl to release the disk when the circuit is finally broken. For these purposes a 130

second disk 57 is provided, and its axle has a bearing at one end in the plate 21 and at the other in a bearing-screw 32, engaged in an arm 33 of the foot-plate 23, the disks being in axial alinement. Disk 57 has a notch 60, which normally lies below the end of the tumbler-arm, in which position it is held by the fact that the center of gravity of the disk is shifted to a point below its axis by removing portions of the disk, as shown in Fig. 2. In the operation of the apparatus the first pulsation that moves disk 31 one step moves also disk 57, so that its notch is out of position to receive the end of the tumbler-arm, and this disk 57 stays out of such position until the final pulsation, which is continued long enough to permit the disk 57 to return to its normal position, with its notch under the end of the tumbler-arm. As this final pulsation also brings the notch of disk 31 into active position, the tumbler-arm may then drop and move the tumbler to release the clapper. To actuate the second disk 57, it is provided with a pawl 58, which is pivoted at the end of the lever 46 in the same manner as the pawl 39, and has a spring-finger 59 engaged with its hook, and which finger is attached to the lever to hold the laterally-bent free end of the pawl against the disk 57. The disk 57 has ratchet-teeth 61 for engagement by the pawl 58 and with which the pawl normally engages. When the electromagnet is energized, however, the pawl 58 is drawn suddenly outwardly to give the disk a sudden whirl and to carry it, with the notch, well away from its normal position. As the pawl is thus moved its laterally-bent engaging end strikes the deflecting rib or strip 62 on plate 21 and is deflected thereby out from engagement with the ratchet-teeth and is held free from the teeth, so that the disk may move freely. The successive pulsations are so short that the disk 57 does not have time to return to its normal position before the next pulsation effects a new movement of the pawl, which gives the disk another shove, so that the disk cannot return to its normal position until the last pulsation, which is of longer duration and which is continued to ring the bell. When this last pulsation is given and which moves disk 31 into active or permissive position, the disk 57 is permitted to return to normal position, and the two notches of the disks being then in alinement and beneath the end of the tumbler-arm the latter drops and the clapper is released, and as the circuit is kept closed the bell is sounded. When the final pulsation is given and the disk 57 returns to normal position, a striking-pin 63 thereon engages the lever 54 and by raising it, as shown in Fig. 2, moves the retaining-pawl from engagement with the disk 31. The rotating pawl is, however, at this time engaged with a tooth of disk 31, and hence the disk 31 cannot return until the circuit is broken to permit the rotating pawl to move from disk 31, at which time the parts return to their

normal positions. It will thus be seen that inasmuch as a long pulsation is required to give the disk 57 time to return to normal position and as in the urging forward of the disk 31 short pulsations are used until the final one the disk 57, which is a guard-disk, cannot return until the final pulsation—i. e., until the proper time. Hence if the present instrument operates with ten pulsations, and there is an instrument in the line that operates with fifteen pulsations, and the latter instrument is being called, the present or tenth pulsation instrument will not operate on the tenth pulsation, for the reason that the tenth pulsation is no longer than any other until the fifteenth, and being short the disk 57 does not have time to return to register its notch with the notch of disk 31 before the next pulsation is given, the pulsations being not only short, but quick. The disk 57 is thus a guard-disk for the disk 31.

Instead of the arrangement of the tumbler shown in Fig. 1 of the drawings, I may use the arrangement shown in Fig. 6, wherein the arm 29 has an extension, to which is pivoted a tumbler in the form of a simple straight-lever or arm 65, which lies transversely of the disks 31 and 57 and which has an upwardly-projecting stop 66, which normally lies in the path of the locking-lug on the hammer or clapper, and when the disks are adjusted to their releasing positions the arm drops into their notches and the locking-lug is released. With this construction it will be seen that to call any subscriber in a common line it is only necessary to close the calling-circuit a corresponding number of times, holding the last closure to ring the bell the desired length of time, and that when the circuit is finally broken the parts return all to their normal positions.

It will be of course understood that the present apparatus may be employed in connection with a signal operable by continuous currents and that other modifications may be made and any suitable materials and proportions be used for the various parts without departing from the spirit of the invention. Furthermore, instead of boring the disks to cause them to stand normally in predetermined positions each of them may be provided with a spiral spring 70, attached at one end to the disk or its shaft and at the opposite end to a suitable support, the springs permitting of displacement of the disks and acting to return them to their normal positions when they are released.

In this application I have illustrated and described certain features of construction which are not included in the claims of the present case, but which will form the subject of future applications for Letters Patent.

What is claimed is—

1. In a device of the class described, a movable member, a tumbler movable into and out of engagement therewith, a notched locking-disk normally holding said tumbler in lock-

ing position, means for moving said disk to unlocking position, a guard-disk also engaging the tumbler, and means for effecting a rapid oscillatory movement of said guard-disk during the movement of the notched disk to unlocking position, substantially as described.

2. In a device of the class described, a movable member, a tumbler movable into and out of engagement therewith, a toothed disk having a notch for the reception of said tumbler to permit the movement of the latter to the unlocked position, means for effecting a step-by-step rotative movement of said disk, a guard-disk also having an unlocking-notch normally in position for the reception of the tumbler, and means for effecting a rapid oscillatory movement of said guard-disk during the movement of the said locking-disk, substantially as described.

3. In a device of the class described, a movable member, a tumbler movable into and out of engagement therewith, a toothed disk having a notch for the reception of said tumbler to permit the movement of the latter to the unlocked position, a guard-disk also engaging said tumbler and having an unlocking-notch adapted for the reception of the said tumbler, said guard-disk having its center of gravity so disposed as to normally maintain the tumbler-receiving notch in position for the entrance of the tumbler, and means for effecting a rapid oscillatory movement of said guard-disk during the movement of the said locking-disk, substantially as described.

4. In a device of the class described, an electromagnet, a movable polarized armature, and a member carried by and movable therewith, means for locking the movable member and for unlocking the same to permit of its movement with the armature, said means comprising a movable tumbler, a disk having a tumbler-receiving notch normally in inactive position, a second or guard disk having a notch normally in position to receive the tumbler, a soft-iron armature for the electromagnet, and mechanism connecting said soft-iron armature to the two disks, substantially as specified.

5. The combination with an electromagnet and a member movable thereby, of a locking device for holding said member normally against movement, pivoted ratchets having notches disposed to receive the locking device simultaneously to permit of movement thereof from operative position, one of said ratchets being constructed to stand normally with its notch out of active position and the other ratchet being constructed to stand with its

notch normally in active position a second armature for the electromagnet, a pawl for each ratchet connected with the second armature for movement thereby to shift the ratchets from their normal positions to carry the notch of the normally inactive ratchet to active position and to move the normally active notch from active position, and means in the path of the pawl of the ratchet with the normally active notch for moving the pawl from the ratchet to permit it to return to its normal position.

6. A device of the class described comprising a tumbler, a ratchet-disk for holding the tumbler normally active and having a notch normally out of active position and adapted when in active position to receive the tumbler to permit it to move from operative position, an electromagnet having an armature, a pawl connected with the armature and in operative relation to the ratchet-disk for moving it with its notch to and beyond its active position, a second ratchet-disk mounted for swinging movement into and out of normal position and having a normally active notch to receive the tumbler, a pawl connected with the armature and in operative relation to the second ratchet-disk to swing it, and means in the path of movement of the second pawl for deflecting it from the ratchet-disk to permit the latter to return to its normal position.

7. A device of the class described comprising a tumbler, ratchet-disks having notches for alinement to receive the tumbler and permit it to move from operative position, one of said disks being arranged to stand normally with its notch out of active position and the other disk being arranged to stand with its notch normally in active position, a pawl for moving each ratchet from its normal position, the normally inactive disk being adapted for movement with its notch beyond the active position thereof, means for moving the pawl of the normally active disk to permit the latter to return to its normal or active position, a retaining-pawl for the first ratchet-disk, and means for engagement by the second disk to move the retaining-pawl from active position when the second disk is released, whereby the first disk may return when released by its rotating pawl.

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

WILLIAM D. WATKINS.

Witnesses:

C. E. DOYLE,

J. ROSS COLHOUN.