I. F. MANNY.

SELECTIVE SIGNALING MEANS.

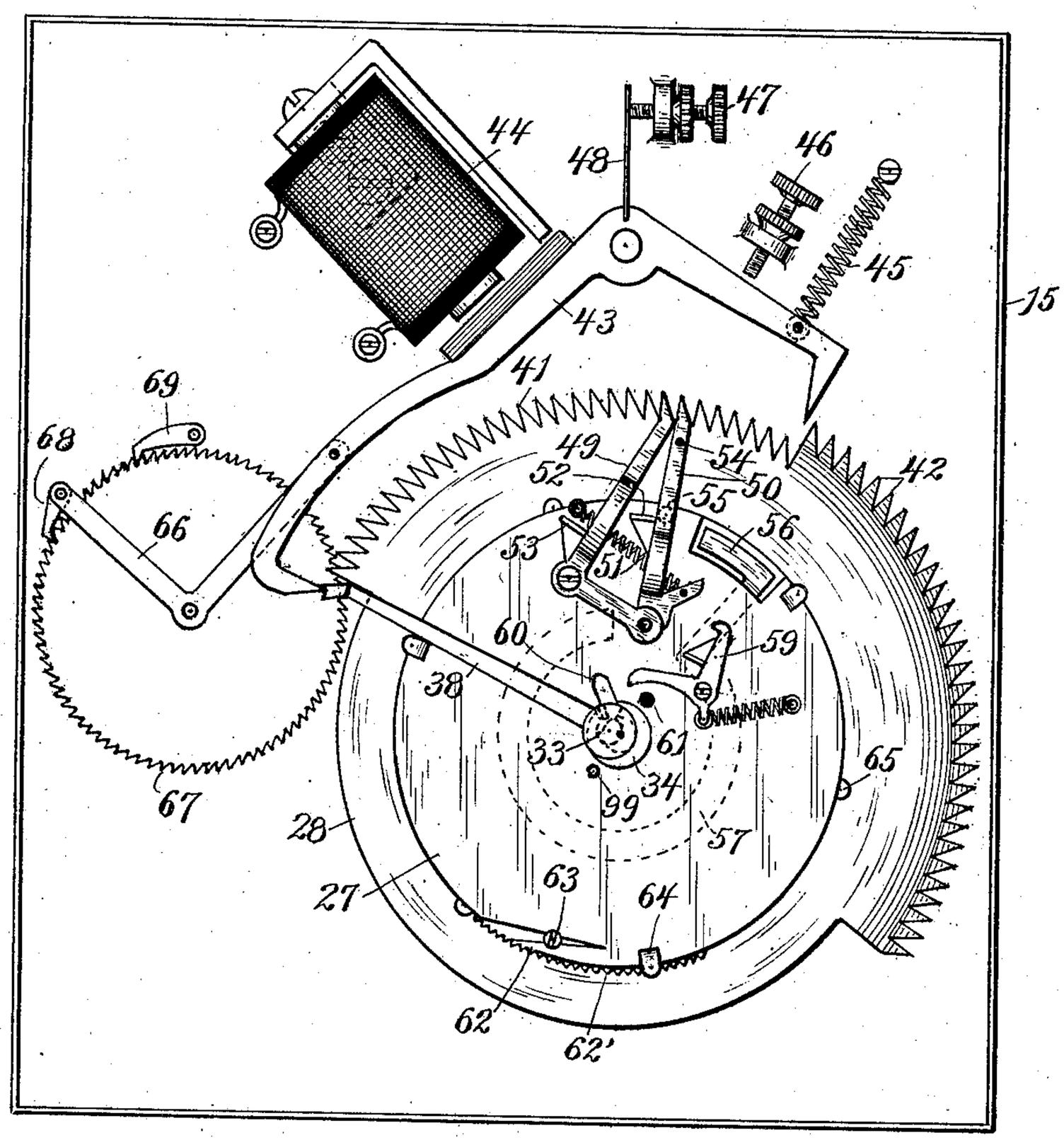
APPLICATION FILED NOV. 29, 1909.

986,639.

Patented Mar. 14, 1911.

6 SHEETS—SHEET 1.

Fig. 1.



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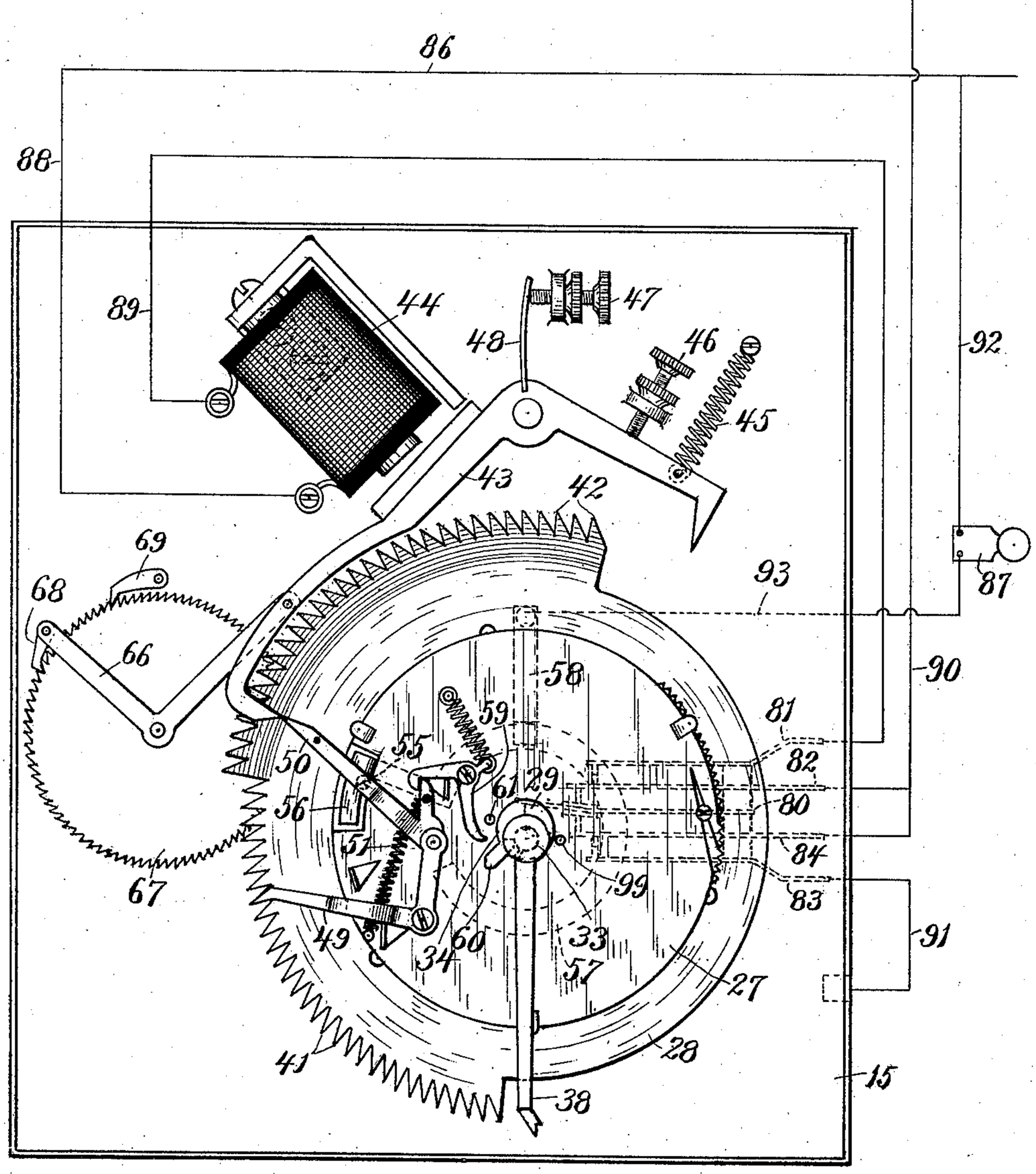
6 SHEETS—SHEET 2.

Fig. 2.



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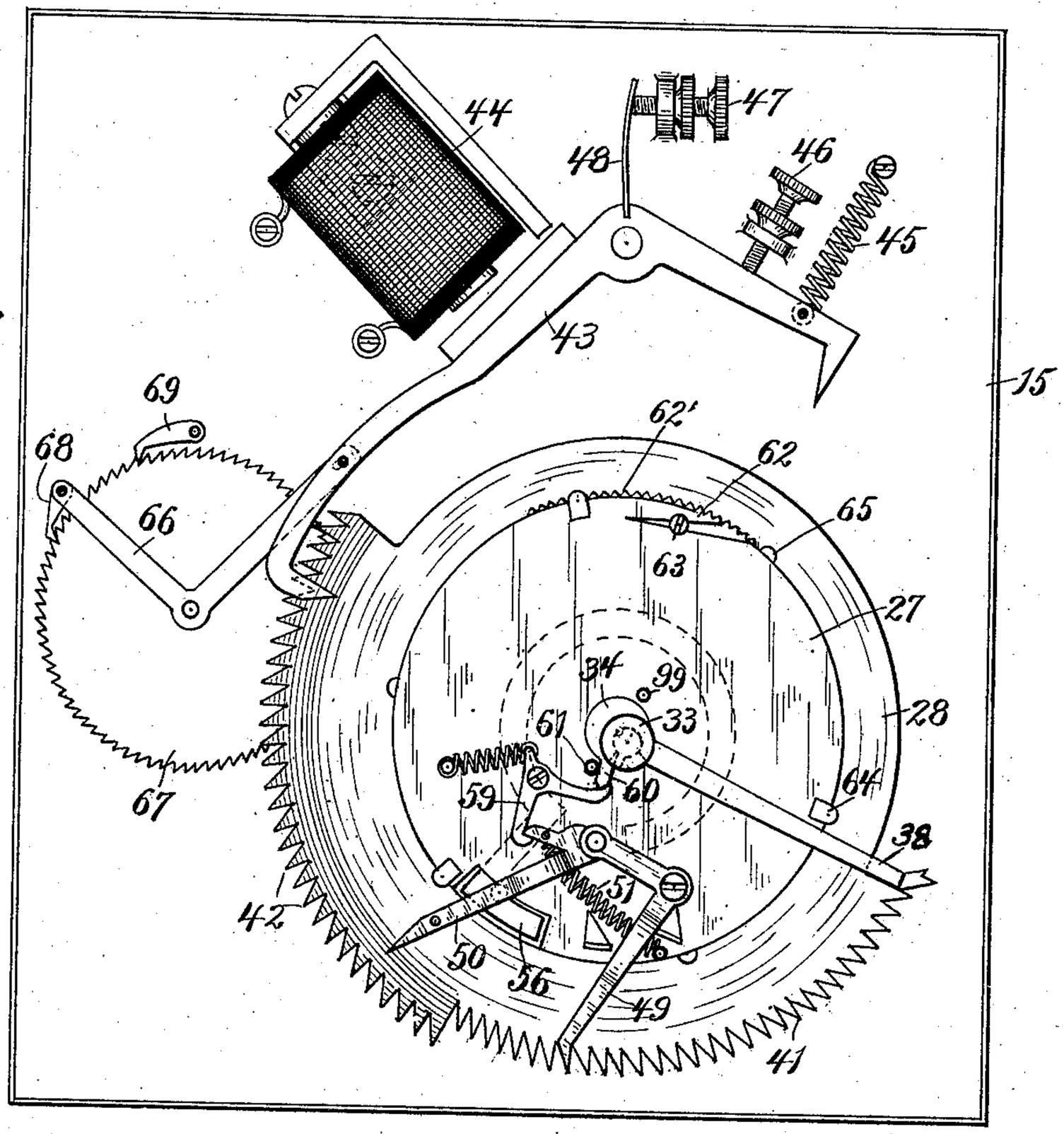
6 SHEETS—SHEET 3.

Fig. 3.



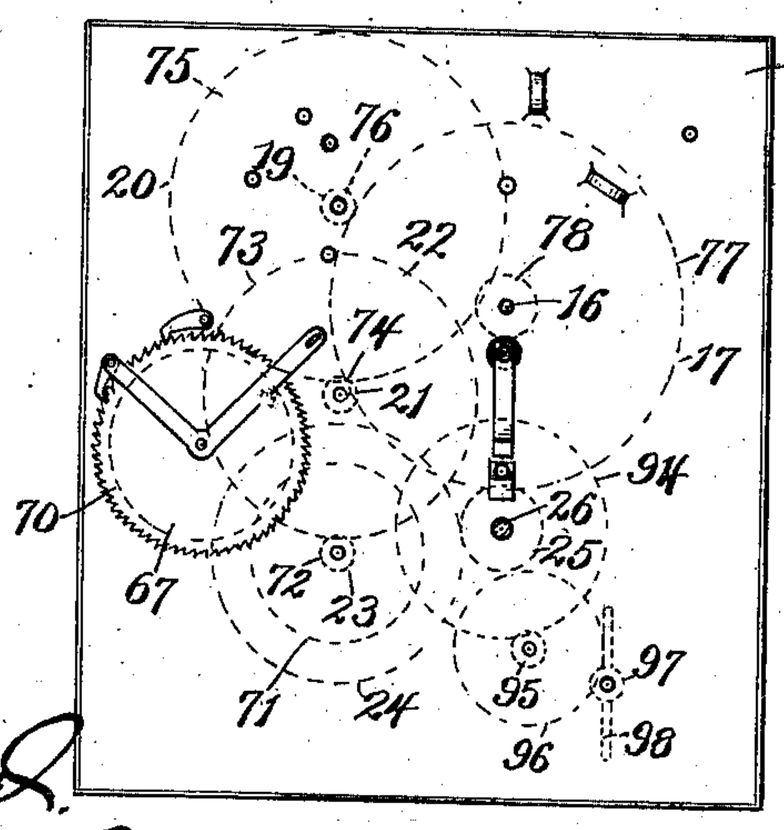


Fig. 12.

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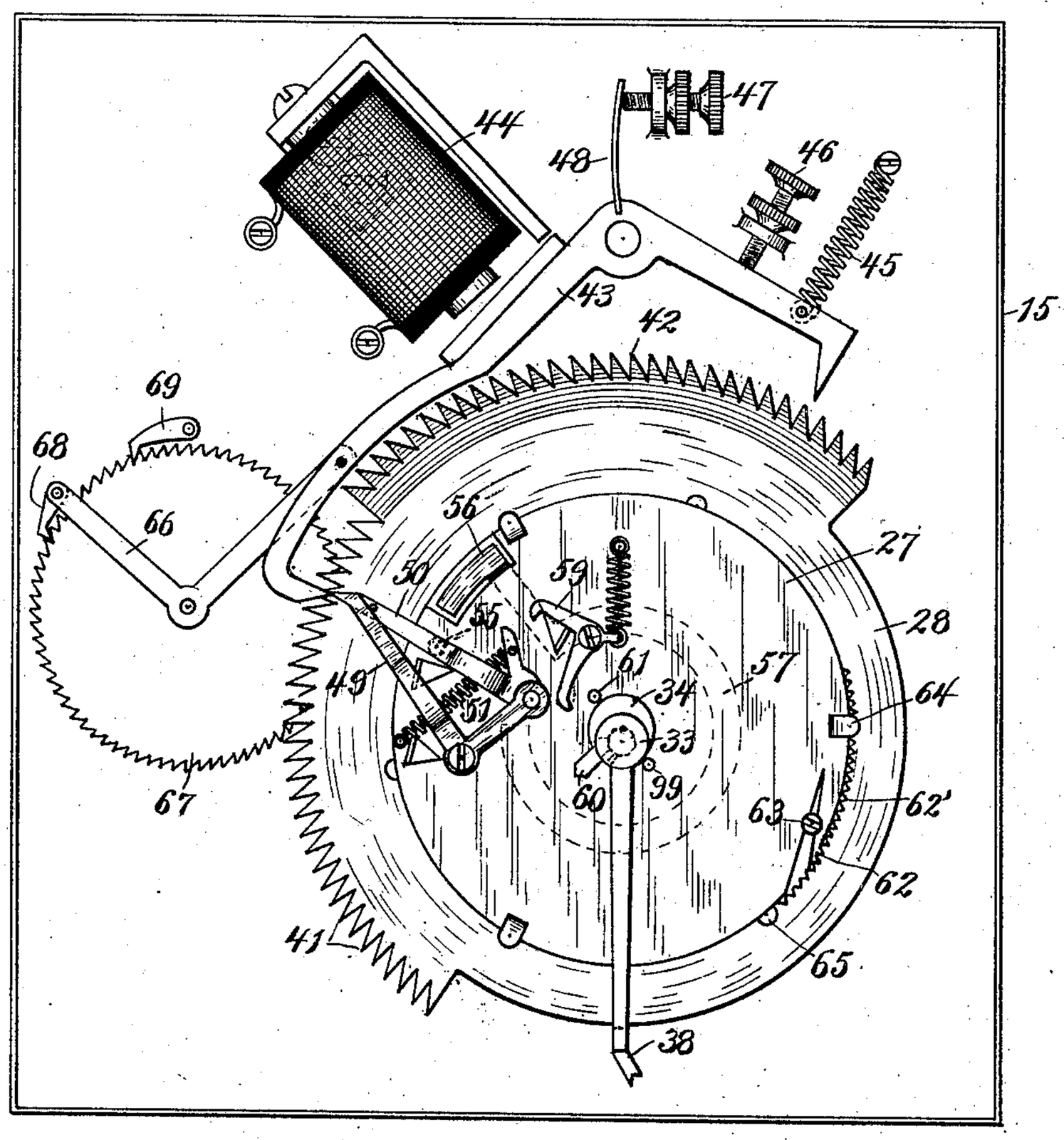
6 SHEETS—SHEET 4.

Fig. 2.



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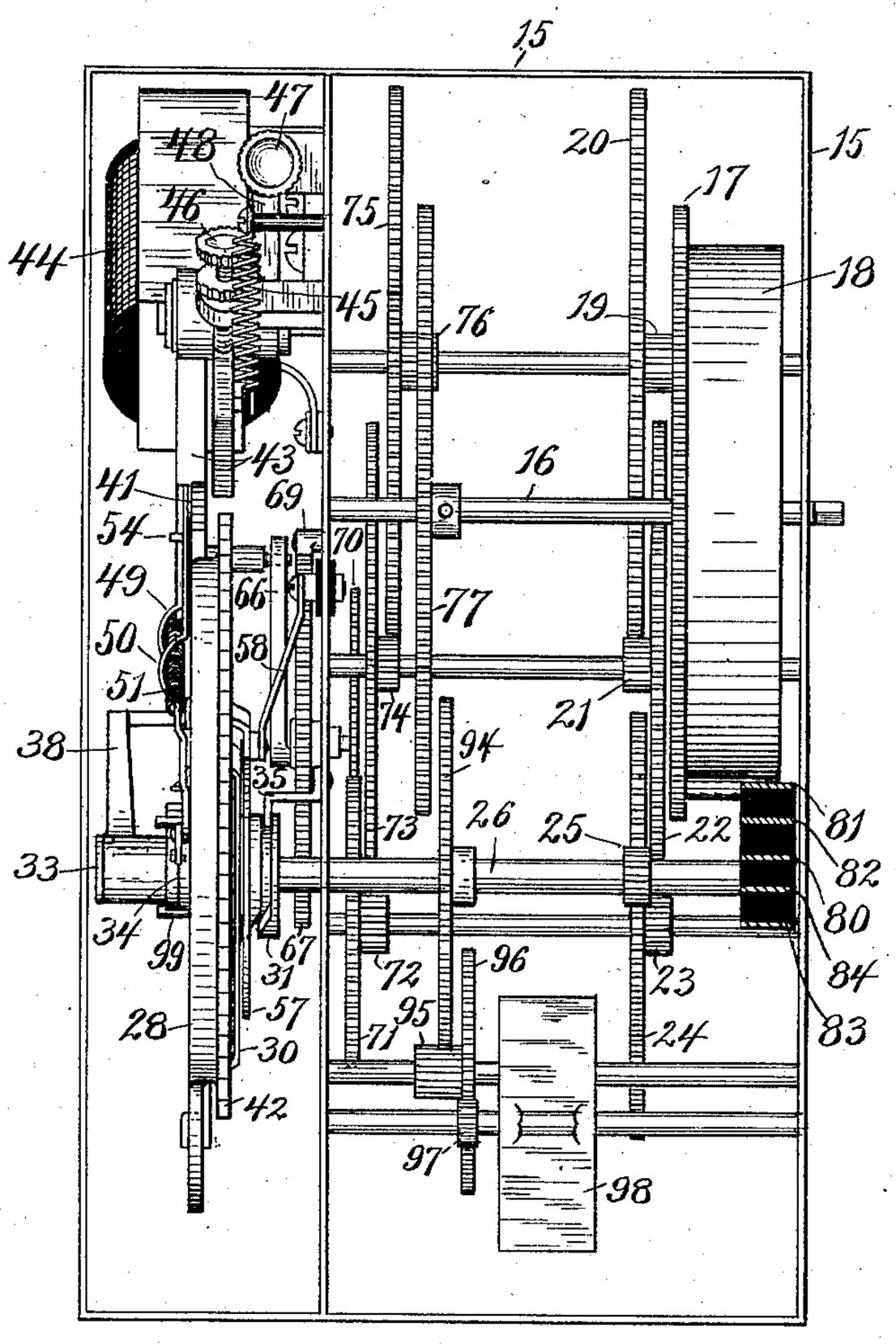
6 SHEETS—SHEET 5.

Fig. 5.



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6 SHEETS—SHEET 6.

Fig. 6.

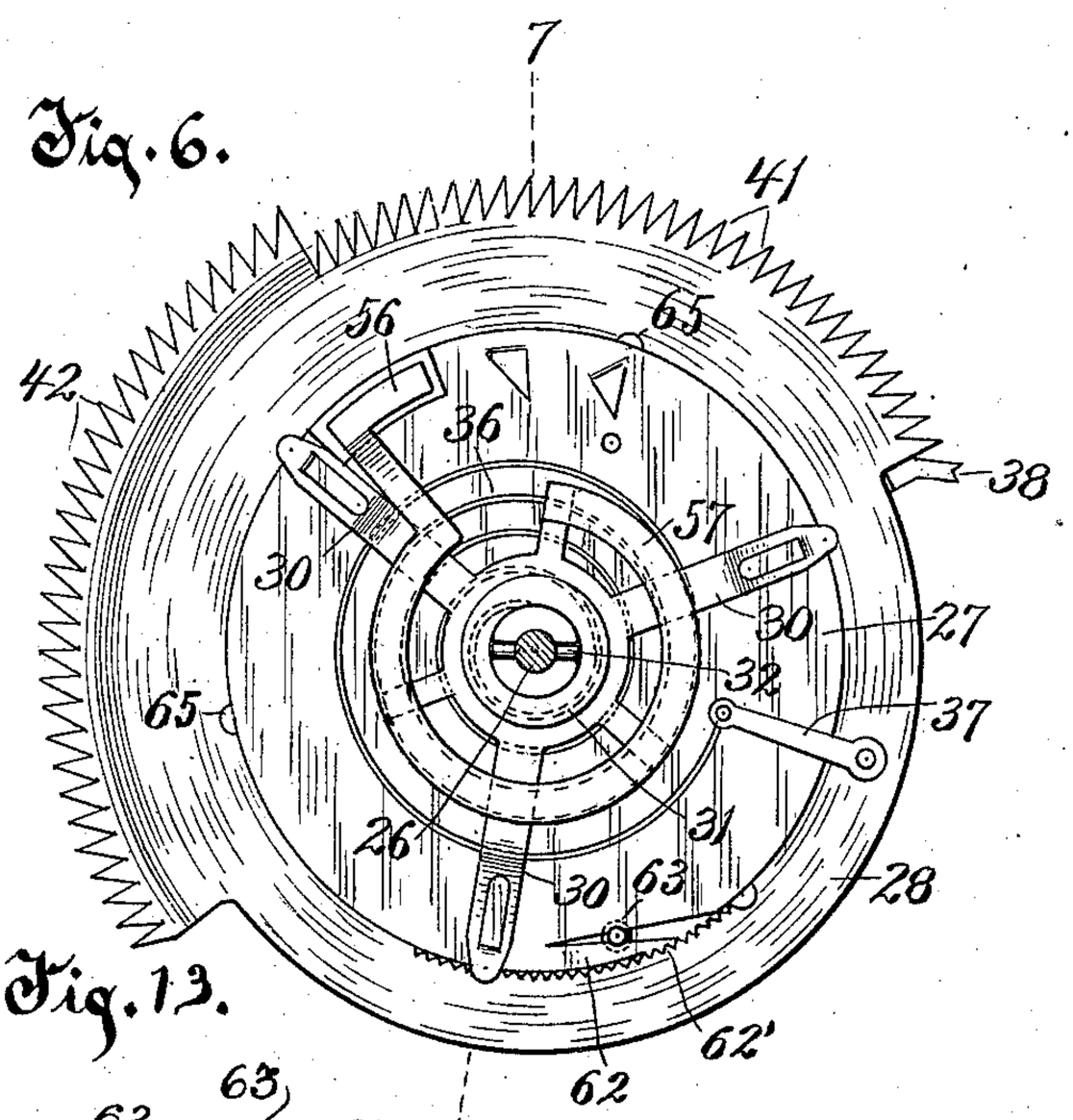


Fig. 7.

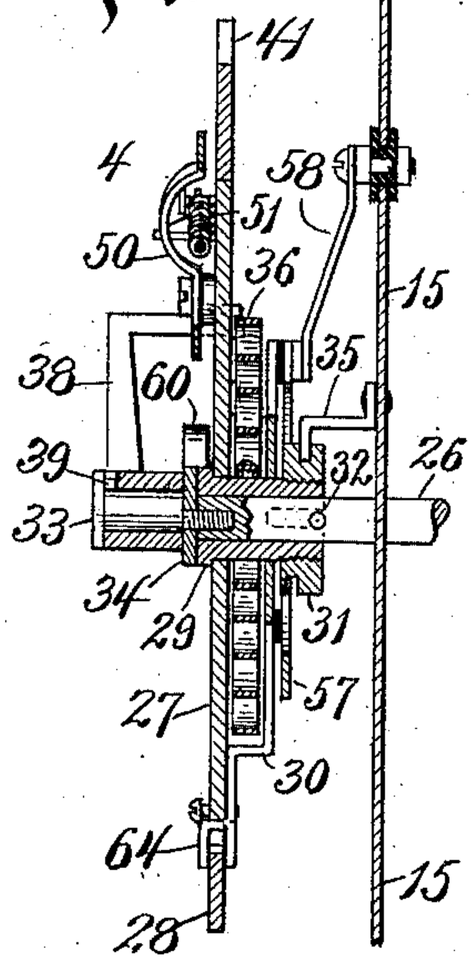


Fig. 13.

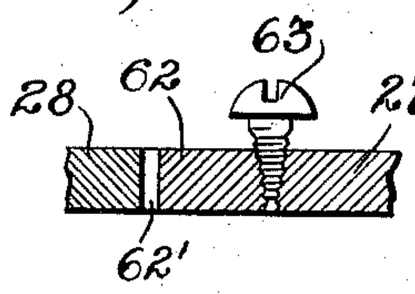


Fig. 8.

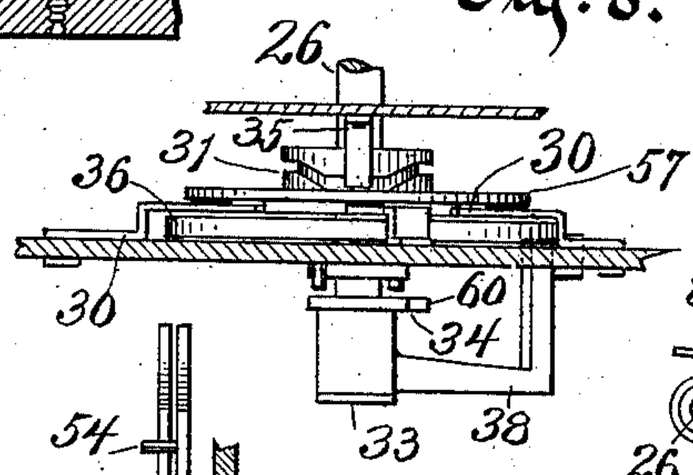


Fig. 10.

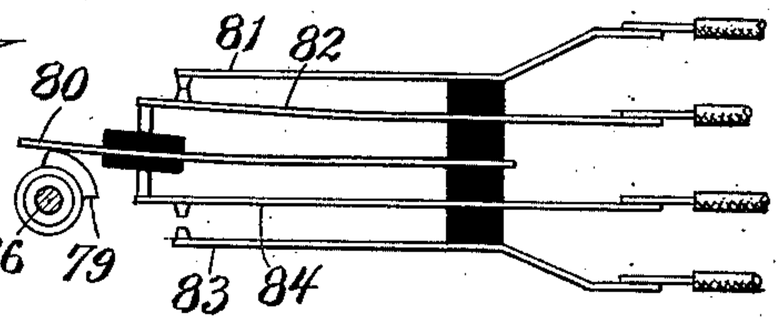


Fig. 9.

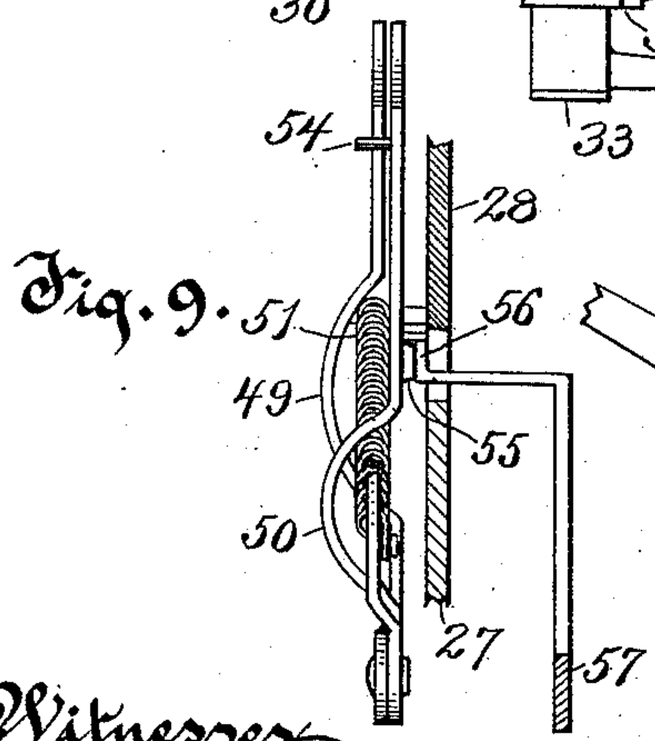
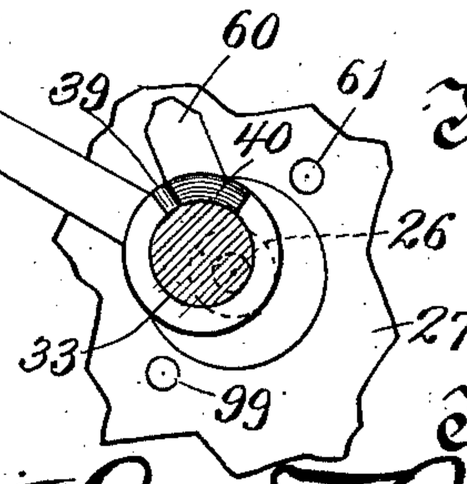


Fig. 11.



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UNITED STATES PATENT OFFICE.

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SELECTIVE SIGNALING MEANS.

986,639. Specification of Letters Patent. **Patented Mar. 14, 1911.**

Application filed November 29, 1909. Serial No. 530,327.

To all whom it may concern:

Be it known that I, IRA F. MANNY, residing in Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Selective Signaling Means, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention relates to selective signaling means for use with telephone or other systems, and has for its object to provide mechanisms to be placed in an electrical circuit at the several stations and caused to be set in operation from the central or signaling station, such mechanisms being so constructed that it is within the power of the operator at the signaling station to effect the signaling at whichever station is desired without signaling the other station.

In order to accomplish the above results the invention comprises a motor driven mechanism detained by a magnet controlled pawl, which when released by the first impulse from the signaling station starts the mechanism in operation, the subsequent impulses from the signaling station serving to permit a step by step escapement of a rotary member which has a yielding connection with the motor, there being a signaling member in a position with relation thereto, depending upon the number of the station, where it is adapted to be engaged by the pawl when the proper number of impulses has been given and the rotary member has been moved out of engagement with the pawl by mechanism actuated by the operation of the motor, whereby the signaling member is detained by the pawl during an advance movement of the rotary member to take up its lost motion due to its detention by the pawl, the result of such detention of the signaling member by the pawl being to bring switch contacts together to complete an electrical signaling circuit. The relation of the signaling member to the rotary member is such that the movements of the latter cause the signaling member to become disengaged from the pawl when the signaling circuit has been completed and in this position of the signaling member it is locked by an automatic means so as to prolong the duration of the signaling contact, such locking means being automatically released to permit the return of the signaling member before the cycle of operation of the instrument is completed, the rotary member being eventually returned by the operation of the motor to its position of engagement with the pawl for detaining the motor again at the starting position of the parts. In the event of the central station sending a greater number of impulses than the number of a particular station, the signaling at that station is prevented by the signaling member thereof having passed beyond the pawl before the pawl is released from the rotary member. However, to prevent the signaling at such station in the event of a number of impulses less than the number of the station, a guard is provided on the rotary member in the path of the pawl when the rotary member is released from the pawl and in advance of the signaling member, the movement of said guard, produced by the advance of the rotary member on being released, causing a retraction of the signaling member out of its normal position where it will not engage the pawl so that it will be released and returned to its normal position without effecting the signaling contact.

Incidental to the above construction it is a further object of this invention to provide for easily changing the instrument to respond to any desired number of impulses within the range of the system for which it is designed. Also an object is to provide the starting arm with means for giving it an outward movement after it has engaged the pawl so as to relieve the burden upon its operating magnet in releasing the motor upon the first impulse of the signal.

Another object is to provide for automatically rewinding a clock mechanism when employed as the motor, such rewinding being effected by the signaling impulses.

Another object is to provide an electrical switch operated by the movements of the motor for changing electrical circuits, such as for substituting a bell or other signaling member for the magnet in the station circuit, whereby the operation of the bell may be effected from the signaling station as well as the selection of the particular station at which the signaling is to be produced.

A further object of the invention is to improve upon details of construction of the various parts of the mechanism.

The invention consists in the construction and relative arrangement of certain parts

and in combinations of parts hereinafter particularly described, and pointed out in the claims, and all equivalents thereof.

In the accompanying drawings I show an exemplifying structure embodying the invention, but it is to be understood that the invention is capable of embodiment in different forms.

Referring to the drawings in which like characters of reference indicate the same parts in the several views: Figure 1 is a front elevation of a selective signaling means constructed in accordance with this invention, the parts being in their normal position; Fig. 2 is a similar view thereof with the parts in the act of producing the signaling, one manner of connecting the local signaling circuit being shown in diagram; Fig. 3 is a similar view with the parts in a further advanced position, showing the signaling member being locked in its contact position; Fig. 4 is a similar view with the parts in position for releasing the signaling member from the pawl by means of the operation of the guard when a signal has been given of a less number of impulses than the number of the station to which this instrument belongs; Fig. 5 is a side elevation of the mechanism; Fig. 6 is a sectional elevation of the rear of the rotary member with its associated parts; Fig. 7 is a vertical sectional view through these parts, showing the means for shifting the rotary member into and out of position for engagement with the pawl; Fig. 8 is a detail view of such shifting means; Fig. 9 is a detail view showing the construction and arrangement of the signaling member and the guard therefor; Fig. 10 is a detail view of the cam actuated switch; Fig. 11 is a detail view of the motor shaft connection for the starting arm; Fig. 12 is a front elevation of the casing with parts removed showing in diagram the relation of the parts of the motor clock work mechanism, and, Fig. 13 is a detailed view of the tapering screw means for securing an adjusting engagement between the disk and ring portions of the rotary member.

In these drawings, referring to Figs. 5 and 12, 15 represents a frame construction or casing in which the parts are contained, the motor as here shown comprising a winding shaft 16 loosely carrying a large driving gear 17 with a motor spring 18 connected at its ends to the winding shaft and the driving gear respectively, and a train of gearing 19, 20, 21, 22, 23, 24 and 25 increasing in speed from the driving gear 17 to a motor shaft 26 which extends a considerable distance in front of the front plate of the frame where it carries the rotary member and the starting arm.

As shown in Figs. 6, 7 and 8 the rotary member is composite, that is, it is made up of a central disk-like portion 27 and an outer ring-like portion 28 surrounding the disk-like portion and adjustably connected therewith. The disk 27 loosely fits on a sleeve 29, shouldered at one end thereof, and is held in place on the sleeve by having a spider frame 30 secured thereto and also fitting on the sleeve to bear against a cam 31 on the other end of the sleeve. The sleeve 29 slidably fits upon the projecting front end of the motor shaft 26, being splined thereon to turn with the shaft while being slidable on it by means of a pin 32 on the shaft fitting in slots of the sleeve. The sleeve is held on the shaft by means of an eccentric stud 33 threaded in the end of the shaft with a washer 34 therebetween, the sleeve engaging the washer to limit its outward movement. A stationary pin 35 projecting from the frame 15 fits in a cam groove of the cam 31 to slide the sleeve on the shaft as the result of the turning movement of the shaft, the sleeve and the parts carried by it being moved rearwardly and then forwardly with each rotation of the shaft. The rotary member is caused to turn by the turning movement of the sleeve because of a spring connection 36 therebetween, said spring being contained within the cage formed for it by the spider frame 30 and connected at one end to the sleeve and at the other end to an arm 37 on the ring portion 28 of the rotary member and permitting the rotary member to be detained during a portion of the rotary movement of the sleeve and causing it to quickly regain its lost motion as soon as released.

A starting arm 38 is loosely mounted on the eccentric stud 33 with a limited play thereon caused by a pin 39 of the stud, Fig. 11, riding in a slot 40 of the starting arm. The outer end of the starting arm 38 extends rearwardly to engage a shoulder on the ring portion 28 of the rotary member where a series of escapement teeth 41 begins. There is another series of escapement teeth 42 on the ring portion 28, beginning at the end of series 41, and this series is preferably farther from the center of the shaft and depressed rearwardly out of the plane of teeth 41, as shown in Fig. 5. An anchor pawl 43 pivotally mounted on the frame is adapted to engage with the teeth 41 and 42 to permit an escapement of the rotary member under the action of the motor as transmitted to it through the light spring 36. The parts are normally arrested by the engagement of the anchor pawl with the starting arm 38, as shown in Fig. 1, the starting arm restraining the motor and the rotary member being held against the starting arm by the action of spring 36. The movement of the anchor pawl 43 to produce the escapement is caused by means of an electro-magnet 44 on the frame attracting its armature which is carried by the anchor

pawl, the return movement being accomplished by a spring 45 and being limited by a set screw 46 while another set screw 47 bears against a leaf spring 48 carried by the anchor pawl for the purpose of adjusting the spring action of the pawl. The starting arm 38 is provided with a notch at its end to form a shoulder against which the pawl bears during its engagement therewith for the purpose of permitting the starting arm to force the pawl toward the magnet by a means to be later described and for the purpose of bringing the armature closer to the magnet and reducing the amount of frictional engagement to be overcome by the pawl in releasing the starting arm when the magnet receives the first impulse.

After the starting arm has been released by the first impulse of the selective series of impulses sent from the central station, the motor being free turns the motor shaft, and the play of the pin 39 in the slot 40 permits the starting arm to drop for a short distance, while the rotary member is given an escapement by the successive operations of the anchor pawl until the selective series of impulses is completed. Then the escapement of the rotary member ceases while the movement of the motor shaft continues, meanwhile placing spring 36 under tension. When the movement of the motor shaft brings the offset portion of the cam groove of cam 31 into engagement with the arm 35 the sleeve 29 is caused to slide rearwardly on the motor shaft and thereby carry the rotary member out of the plane of engagement with the pawl so as to disengage the pawl therefrom. The rotary member being thus released from the pawl quickly turns under the action of spring 36 to take up the motion which it has lost by its detention.

Pivotally mounted on the disk portion 27 of the rotary member is a bell crank lever 49 having one arm extending alongside of one of the teeth 41 and the other arm provided with a signaling member 50 pivoted thereon and normally standing alongside of the tooth 41 following the tooth by which the end of lever 49 stands. A spring 51 connects the signaling member 50 with the disk portion 27 of the rotary member in such a manner that it tends to hold both the signaling member 50 and the lever 49 in their normal positions just described against stops 52 and 53 respectively which are preferably formed by lugs bent up from the disk 27. The spring 51 is adapted to return either the signaling member alone to its normal position or the lever 49 with the signaling member. The lever 49 and the signaling member 50 are arched to avoid the spring 51, as shown in Fig. 9, and the signaling member has a projecting pin 54 on its front face for engagement with the lever 49 and a contact lug 55 on its rear face capable of engaging with a contact 56 which projects through an opening in the disk portion 27 of the rotary member without engaging the walls thereof. The contact 56 comprises the end of a strip of metal which forms a contact ring 57 mounted on the arms of spider frame 30 but insulated therefrom, there being a spring brush 58 mounted on but insulated from the casing 15 to engage the contact ring 57 and thereby establish electrical connection with the spring contact 56. There is a break in the ring 57, shown in Fig. 6, which forms a gap for breaking the circuit established by the engagement of the signaling member with the contact 56 by the brush 58 instead of by the signaling member.

When the number of impulses of the selective series of impulses sent from the central or signaling station to all of the substations on the line corresponds with the number of a particular instrument the rotary member of such instrument is permitted an escapement which is just sufficient to bring into engagement with the anchor pawl that tooth 41 which stands alongside of the signaling member 50, and consequently when the change in position of the rotary member is effected by the action of cam 31 the signaling member 50 will be engaged by the pawl and detained thereby while the rotary member turns under the action of spring 36 to take up its lost motion with relation to the motor shaft and such detention of the signaling member by the pawl causes such member to swing on its pivotal connection with the lever 49 and into engagement with the spring contact 56, as shown in Fig. 2, where it escapes from its engagement with the pawl by its angular position but is caught by a spring actuated bell crank dog 59 on the disk 27 and is locked thereby against turning to its normal position. An electrical circuit is completed by the engagement of the signaling member 50 with the spring contact 56 to produce a signal in any desirable manner at that station.

The signaling member 50 being locked in its contacting position by the dog 59 continues the signal through the remainder of the cycle of operation of the rotary member until the starting arm 38 reaches the starting point where it engages with the pawl 43, when a lug 60 projecting from the washer 34 on the motor shaft forces its way from behind the curved end of dog 59 to cause said dog to swing and release the signaling member and permit its spring to return it to its normal position. The lug 60 has acquired its position behind the curved end of dog 59 by reason of the shifting of the rotary member on the motor shaft, the end of the dog passing the lug 60 while the rotary member is in the rear position and being brought into the plane of the lug when the

rotary member is returned to its front position. The pin 61 on the disk 27 engages the lug 60 to limit the advance of the rotary member on the motor shaft when it is released from the pawl after being detained thereby, and the position of the lug 60 between the pin 61 and the curved end of dog 59 is shown in Fig. 3, which position is maintained until the starting arm 38 is again engaged by the pawl 43, as above mentioned, and the continued motion of the motor shaft, permitted by the play of pin 39 in slot 40, causes the release of the signaling member from the dog and when the pin 39 reaches the end of slot 40 the motor is brought to rest with the parts in their normal positions. This travel of the pin 39 in the slot 40 from the time of engagement of the starting arm with the pawl to the time of stopping the motor permits a sufficient angular movement of the eccentric stud 33 on which the starting arm is mounted to give said starting arm an endwise movement that will force the pawl 43 against the action of its spring and bring the armature closer to the magnet, as shown in Fig. 1.

Should the number of impulses in the series of signaling impulses be greater than the number of the instrument under consideration, it is obvious that the signaling member then having passed the pawl 43 will not be engaged thereby when the rotary member is shifted and the signaling circuit at that station will not be affected. When, however, the number of impulses in the series of signaling impulses is less than the number of the instrument under consideration, the guard lever 49 will be in position to be first engaged by the pawl and will be swung thereby, as shown in Fig. 4, to withdraw the signaling member 50 from the path of the pawl, and both the guard lever and the signaling member will escape from the pawl without the signaling member being brought into engagement with the spring contact 56, the spring 51 restoring both the signaling member and the lever 49 to their normal positions as soon as they are released from the pawl.

In order that the instrument may be adjusted to respond to any number of impulses desired within the range of the system the disk 27 is made adjustable within the ring 28. A simple means for accomplishing this adjustment is shown in the drawings, the edge of the disk being slotted to provide a toothed projection 62 to engage with a series of notches 62′ on the inner edge of the ring, there being a tapering screw 63 threaded in the slot to crowd the projection 62 into the notches 62′.

The engagement between the disk 27 and the ring 28 is made by the ends of arms of the spider frame 30, Figs. 6 and 7, which bear against the rear faces of the ring and which have tongues 64 cut therefrom and passed through openings in the edge of the disk and bent outwardly on the front of the disk to overlap the meeting line between the disk and ring. The ends of three equally spaced arms of the spider frame are thus caused to bear against both faces of the ring and disk and thereby hold the ring in place on the disk, though permitting the movement of the disk within the ring for the purpose of adjustment as described. For convenience in entering the tongues 64 through the ring the inner edge of the ring is provided with notches 65 which are so disposed that they do not come in line with the tongues 64 in any operative adjustment of the disk within the ring.

The clock work mechanism may be rewound in any desired manner, as by means of the usual key, but it is considered desirable to provide for rewinding by means of the movements of the anchor pawl 43. One form of such mechanism is illustrated in the drawings and comprises a bell crank lever 66 pivotally mounted on the shaft of a ratchet wheel 67 and loosely connected at one end to the pawl 43 while carrying a dog 68 at its other end to engage the teeth of the ratchet wheel 67 and turn the same with the successive swinging movements of the pawl 43 caused by the pulsations of the signal, there being a detent 69 for preventing the backward turning of the ratchet wheel. Referring to Figs. 5 and 12, the shaft on which the ratchet wheel 67 is mounted is geared down to the winding shaft 16 through the successive gears and pinions 70, 71, 72, 73, 74, 75, 76 and 77, most of which are loosely mounted on shafts common to the motor mechanism and the last being fastened on the winding shaft 16. Thus the movements of the ratchet wheel 67 are caused to rewind the spring 18, the object being to keep said spring in a condition to operate the mechanism. It is also thought desirable in some cases to provide for operating a switch by means of the motor shaft 26 and for this purpose the shaft has a cam 79, Fig. 10, which is adapted to move a spring member 80 of a switch mechanism and cause it to bring into engagement a pair of insulated spring contacts 81 and 82 in one position of the motor shaft and to bring into engagement a pair of insulated spring contacts 83 and 84 in another position of the shaft, each pair of spring contacts being disengaged when the other pair is engaged. This switch mechanism may be utilized for various purposes such as switching the line connection from the magnet 44 of the instrument to a branch line of instruments which will be responsive to another series of selective impulses made before the completion of the cycle of movement of the rotary member of the first considered instrument, to cause the

signaling at one of the instruments in such branch circuit.

Other objects may be accomplished by the cam actuated switch mechanism, such as substituting a bell or other signal means in the line circuit for the magnet 44 when the switch is operated, such bell having in its circuit the brush 58 so as to be controlled by the contact made by the signaling member 50 with the spring contact 56. The cam 79, of course, is so arranged that the change in the circuit connections made thereby will not take place until after due allowance has been made for all selective signaling impulses for which the system is intended. The latter connection of the cam operated switch is illustrated in diagram in Fig. 2, where the two main line wires 85 and 86 are connected alternately with the magnet 44 and a bell 87 by means of the cam operated switch mechanism. A wire 88 connects line wire 86 with magnet 44 and a wire 89 connects the other terminal of magnet 44 with switch contact 81. A wire 90 connects line wire 85 with switch contacts 82 and 84, while the other switch contact 83 is grounded on the frame 15 of the instrument by means of a wire 91. A wire 92 connects the line wire 86 with bell 87 and a wire 93 connects the other terminal of the bell with brush 58. With these connections the signaling impulses sent over the line wires 85 and 86 from the central station are received by the magnet 44 of each station, the circuit thereof being from line wire 86 through wire 88 to magnet 44 and thence through wire 89 and closed switch contacts 81 and 82 through wire 90 to the other line wire 85. When the time for signaling impulses has passed the cam 79 passes from beneath the spring member 80 to permit it to disconnect the switch contacts 81 and 82 to open the circuit through the magnet 44 as just traced and engage switch contacts 83 and 84 to close a circuit including the bell 87 and the brush 58, the latter circuit being from line wire 86 through wire 92 to bell 87 and thence through line 93 to brush 58, through the contact ring 57 engaged by the brush and the spring contact 56 of said contacting ring to the signaling member 50, if the impulses have been of the necessary number for causing the signal at the instrument under consideration, and through the frame of the instrument with which the signaling member is in metallic connection through the operative parts, by way of wire 91 from said frame to the engaged switch members 83 and 84, and then through wire 90 to line wire 85. During the continuance of the circuit last described a ringing current sent over the line wires from the central station will cause the operation of the bell 87 at that station only which has been called by the series of selective impulses.

Rather than to have the signaling circuit broken at the point of engagement between the signaling member and the spring contact 56 the gap is provided in contact ring 57 so that said contact ring leaves the brush 58 before the signaling member is released by the dog 59 and the break of the signaling circuit is therefore made at the brush.

It is obvious that the bell 87 may be of the alternating current type and that the alternating current circuit for operating same may be closed at the signaling station throughout the signaling operation so as to be effective as soon as the signaling contact is made.

In order to retard the action of the motor the motor shaft 26 is preferably geared up to a governor of any suitable type, as here shown, Fig. 5, the connection being by way of gear 94 and pinion 95 and gear 96 and pinion 97 to a fan 98.

The disk 27 is provided with a pin 99 similar to pin 61 and approximately diametrically opposite thereto which is adapted to engage the lug 60 to cause the rotary member to be positively driven by the motor shaft should the spring 36 become ineffective to disengage the signaling member or the guard from the pawl.

The operation of the several parts having been described incidental to the description of their construction and arrangement, it will be sufficient to briefly review the several steps in the cycle of operation of the instrument in the order in which they occur.

The first impulse of the selective series of impulses received by the instrument from the central station causes the magnet 44 to swing the anchor pawl 43 and release the starting arm 38 which immediately drops to take up the play of the pin 39 in slot 40 and as such arm has ceased to block the operation of the motor the motor shaft begins to turn. The successive impulses cause the escapement of the rotary member under the pressure of the light spring 36, and these impulses may be rapidly made since the rotary member may turn even faster than the motor shaft owing to the lead of the starting arm due to its dropping movement. After a sufficient time has elapsed for the sending of the maximum number of impulses for which the system is designed the offset portion of the groove in cam 31 reaches the arm 35 and moves the rotary member rearwardly on the motor shaft to withdraw it from the plane of engagement with the anchor pawl, thus releasing the rotary member from the pawl and permitting it to quickly turn under the action of spring 36 to catch up with the motor shaft, the free movement of the rotary member being limited by the engagement of pin 61 with the lug 60. If the number of impulses received was greater than the number

of the instrument, the signaling member 50 would have passed the anchor pawl and would therefore be unaffected thereby when the rotary member was released, or if the number of impulses were less than the number of the instrument the guard lever 49 coming into engagement with the anchor pawl first would withdraw the signaling member from engagement therewith before the signaling member reached the contact 56 and consequently the signaling circuit would not be closed, but if the number of impulses were the same as the number of the instrument, the signaling member being in position to engage the anchor pawl at the time the rotary member was released, said signaling member would have been detained by the pawl until it was brought into engagement with the signaling contact and into a locking connection with the dog 59, so that the signaling circuit would be closed and remain closed until near the end of the cycle of operation, when the contact ring 57 would ride off of the brush 58 and the starting arm 38 would again engage with the anchor pawl and be held thereby while the motor shaft continued to turn to take up the play of the pin 39 in slot 40 and thereby move the lug 60 from behind the curved end of dog 58 to release the signaling member and permit it to return to its normal position. Thus all the parts are returned to their normal positions ready for another signaling operation.

The swinging movements of the anchor pawl causes the lever 66 to turn the ratchet wheel 67 and rewind the spring of the motor.

I desire it to be understood that this invention is not limited to any specific form or arrangement of parts except in so far as such limitations are specified in the claims.

What I claim as my invention is—

1. A selective signaling device, comprising a suitably operated pawl, a motor driven rotary member having escapement teeth engaged by the pawl, means for moving the rotary member out of the path of the pawl, and a signaling member in position to be engaged by the pawl for producing a signal when the rotary member is moved out of the path of the pawl from a position in which the pawl engages a tooth corresponding to the number of the signaling device.

2. A selective signaling device, comprising a suitably operated pawl, a motor driven rotary member having escapement teeth engaged by the pawl, means for moving the rotary member out of the path of the pawl, a signaling member movable with the rotary member in position to be engaged by the pawl when the rotary member is moved out of the path of the pawl from the position in which the pawl engages the tooth corresponding to the number of the signaling device, and a signaling circuit with a contact carried by the rotary member and adapted to be closed when the said contact engages the signaling member by reason of the detention of the signaling member by the pawl.

3. A selective signaling device, comprising a suitably operated pawl, a motor driven rotary member having escapement teeth engaged by the pawl, means for moving the rotary member out of the path of the pawl, a signaling member moving with the rotary member in position to be engaged by the pawl when the rotary member is moved out of the path of the pawl from a position in which the pawl engages the tooth corresponding to the number of the signaling device, a signaling contact carried by the rotary member and insulated therefrom and adapted to move into engagement with the signaling member when the latter is detained by the pawl, and means for temporarily locking the signaling member in its position of engagement with the signaling contact.

4. A selective signaling device, comprising a suitably operated pawl, a motor shaft, a rotary member slidably mounted on the motor shaft and adapted to receive motion therefrom, a cam carried by the rotary member, a stationary arm engaged by the cam for moving the rotary member out of the path of the pawl, and a signaling member carried by the rotary member in a position to be engaged by the pawl when the rotary member is moved out of the path of the pawl from a position in which the pawl engages the tooth corresponding to the number of the signaling device.

5. A selective signaling device, comprising a suitably operated pawl, a motor shaft, a sleeve splined on the motor shaft, a rotary member loosely mounted on the sleeve and having a yielding connection therewith so as to receive motion from the motor shaft, a cam carried by the sleeve, a stationary arm engaged by the cam for moving the rotary member out of the path of the pawl, and a signaling member carried by the rotary member in a position to be engaged by the pawl when the rotary member is moved out of the path of the pawl from a position in which the pawl engages the tooth corresponding to the number of the signaling device.

6. A selective signaling device, comprising a suitably operated pawl member, a motor driven rotary member having escapement teeth engaged by the pawl member, means for moving one of said members laterally to disengage the pawl from the rotary member, a signaling member movable with the rotary member in a position to be engaged by the pawl when the pawl is thus disengaged from the tooth of the rotary member corresponding to the number of the signal-

ing device, an angular lever pivotally mounted on the rotary member having the signaling member pivoted to one arm thereof and its other arm forming a guard in advance of the signaling member to be engaged by the pawl for removing the signaling member from engagement with the pawl when the pawl is disengaged from a tooth of the rotary member in advance of the tooth corresponding to the number of the signaling device.

7. A selective signaling device, comprising a suitably operated pawl member, a motor driven rotary member having escapement teeth engaged by the pawl member, means for moving one of said members laterally with relation to the other member to disengage the pawl from the rotary member, a guard member pivotally mounted on the rotary member and standing in position to be engaged by the pawl when the pawl is disengaged from a tooth of the rotary member in advance of the tooth corresponding to the number of the signaling device, a spring actuated signaling member pivotally mounted on the guard member and standing in a position to be engaged by the pawl when the pawl is disengaged from the tooth of the rotary member corresponding with the number of the signaling device, and a signaling contact carried by the rotary member in a position to be engaged by the signaling member when the signaling member alone is engaged by the pawl, the engagement of the pawl with the guard member serving to withdraw the signaling member from engagement with the pawl before the signaling member engages the signaling contact.

8. A selective signaling device, comprising a suitably operated pawl member, a motor driven rotary member having escapement teeth engaged by the pawl member, means for moving one of said members laterally with relation to the other member to disengage the pawl from the rotary member, a spring retracted signaling member carried by the rotary member in position to be engaged by the pawl when the rotary member is disengaged therefrom, a signaling contact carried by the rotary member to be engaged by the signaling member, and means on the rotary member for temporarily locking the signaling member in its position of engagement with the signaling contact.

9. A selective signaling device, comprising a suitably operated pawl, a motor driven shaft, a rotary member mounted on the shaft and yieldingly connected thereto so as to receive motion therefrom, there being escapement teeth on the rotary member engaged by the pawl, means for moving the rotary member out of engagement with the pawl, a guard member pivotally mounted on the rotary member and standing in a position to be engaged by the pawl when the rotary member is disengaged therefrom at a tooth in advance of the tooth corresponding with the number of the instrument, a spring retracted signaling member pivotally mounted on the guard and standing in a position to be engaged by the pawl when the rotary member is disengaged therefrom at the tooth corresponding with the number of the instrument, a signaling contact carried by the rotary member to be engaged by the signaling member when the signaling member is operated by the pawl, a dog on the rotary member for engaging and locking the signaling member in the position in which it engages the signaling contact, and a lug on the motor shaft for releasing the dog from the signaling member.

10. A selective signaling device, comprising a suitably operated pawl, a motor driven shaft, a starting arm carried by the motor shaft with a limited rotary play thereon and normally engaged by the pawl, a rotary member mounted on the shaft and yieldingly connected thereto so as to receive motion therefrom, said rotary member engaging the starting arm to be normally held thereby against movement and having escapement teeth to be engaged by the pawl, means for moving the rotary member out of engagement with the pawl, a guard member pivotally mounted on the rotary member and standing in a position to be engaged by the pawl when the rotary member is disengaged therefrom at a tooth in advance of the tooth corresponding with the number of the instrument, a spring retracted signaling member pivotally mounted on the guard and standing in a position to be engaged by the pawl when the rotary member is disengaged therefrom at the tooth corresponding with the number of the instrument, a signaling contact carried by the rotary member to be engaged by the signaling member when the signaling member is operated by the pawl, a dog on the rotary member for engaging and locking the signaling member in the position in which it engages the signaling contact, and a lug on the motor shaft for releasing the dog from the signaling member.

11. A selective signaling device, comprising a pawl, a magnet for operating the pawl, a motor driven shaft, a rotary member mounted on the shaft and having a flexible connection therewith to receive motion therefrom, said rotary member having escapement teeth to be engaged by the pawl, a starting arm having connection with the motor shaft and normally engaged by the rotary member and the pawl, means for disengaging the rotary member from the pawl, a signaling member carried by the rotary member and adapted to be engaged by the pawl for producing a signal when the rotary member is disengaged therefrom, and means

for moving the pawl closer to the magnet for the normal position of the parts whereby it will be more easily operated by the magnet.

12. A selective signaling device, comprising a pawl, a magnet for operating the pawl, a motor driven shaft, a starting arm having an eccentric connection with the motor shaft and having a limited rotary play thereon and normally engaged by the pawl, a rotary member mounted on the shaft, a spring connecting the rotary member with the shaft, said rotary member engaging the starting arm to be normally held thereby against movement and having escapement teeth to be engaged by the pawl, means for moving the rotary member to be engaged by the the pawl, and a signaling member carried by the rotary member to be engaged by the pawl for producing a signal when the rotary member is disengaged from the pawl, the play of the starting arm on the motor shaft serving to permit a further movement of the motor shaft after the starting arm reëngages the pawl whereby the eccentric mounting of the starting arm causes it to move the pawl to an intermediate position where it will be more easily moved by the magnet.

13. A selective signaling device, comprising a suitably operated pawl, a motor driven rotary member having escapement teeth engaged by the pawl, means for disengaging the rotary member from the pawl, a contact, and a signaling member carried by the rotary member in position to be engaged by the pawl when the rotary member is disengaged therefrom at the tooth corresponding to the number of the instrument whereby the signal member is caused to engage with the contact for producing a signal, said rotary member comprising two portions adjustably connected together, one of which carries the signaling member and the contact and the other of which carries the escapement teeth, whereby the instrument may be made to respond to the number of signals desired.

14. A selective signaling device, comprising a suitably operated pawl, a motor driven rotary member having escapement teeth engaged by the pawl, means for disengaging the rotary member from the pawl, and a signaling member carried by the rotary member in position to be engaged by the pawl when the rotary member is disengaged therefrom at the tooth corresponding to the number of the instrument for producing a signal, said rotary member comprising a disk portion and a surrounding ring portion, a projection on one portion, adjusting teeth on the other portion to be engaged by the projection, and means for forcing the projection into the adjusting teeth for locking the two portions of the rotary member in the desired adjustment, the disk portion of the rotary member carrying the signaling member and the ring portion of the rotary member carrying the escapement teeth.

15. A selective signaling device, comprising a suitably operated pawl, a motor shaft, a rotary member mounted thereon having escapement teeth to be engaged by the pawl, a spider frame mounted on the rotary member and forming a spring casing, a coil spring contained within the spring casing and forming a yielding connection between the rotary member and the motor shaft, means for disengaging the rotary member from the pawl, a signaling member on the rotary member to be engaged by the pawl when the rotary member is disengaged therefrom at the tooth corresponding to the number of the instrument, said rotary member comprising a disk like portion carrying the signaling member and a surrounding ring portion carrying the escapement teeth, the arms of the spider frame bearing on one face of the rotary member against both portions thereof at the line of meeting therebetween, and tongues projecting from said arms of the spider frame and passing through one portion of the rotary member and bearing at the other face of the rotary member against both portions thereof at the meeting line therebetween, there being notches in one of the portions of the rotary member to permit of the passage of the tongues therethrough in one adjustment of the portions of the rotary member.

16. A selective signaling device, comprising a suitably operated pawl, a motor shaft, a rotary member mounted thereon having escapement teeth to be engaged by the pawl, a spider frame mounted on the rotary member and forming a spring casing, a coil spring contained within the spring casing and forming a spring connection between the rotary member and the motor shaft, means for disengaging the rotary member from the pawl, a signaling member on the rotary member to be engaged by the pawl when the rotary member is disengaged therefrom at the tooth corresponding with the number of the instrument, said rotary member comprising a disk like portion carrying the signaling member and a surrounding ring portion carrying the escapement teeth and having the spring connected thereto, the arms of the spider frame bearing on one face of the rotary member against both portions thereof at the line of meeting therebetween, tongues projecting from the arms of the spider frame and passing through one portion of the rotary member and bearing at the other face of the rotary member against both portions thereof at the meeting line therebetween, a contact ring mounted on and insulated from the arms of the spider frame having a gap at one portion and a projection passing

through the disk portion of the rotary member to be engaged by the signaling member when the signaling member is engaged by the pawl, and a stationary spring brush adapted to bear on the contact ring.

17. A selective signaling device, comprising a suitably operated pawl, a spring motor, a motor shaft driven thereby, a rotary member receiving motion from the motor shaft and having escapement teeth engaged by the pawl, means for disengaging the rotary member from the pawl, a signaling member in position to be engaged by the pawl when the rotary member is disengaged therefrom at a tooth corresponding to the number of the instrument, and means operated by the movements of the pawl for rewinding the spring motor.

18. A selective signaling device, comprising a suitably operated pawl, a spring motor, a motor shaft driven thereby, a rotary member receiving motion from the motor shaft and having escapement teeth engaged by the pawl, means for disengaging the rotary member from the pawl, a signaling member in position to be engaged by the pawl when the rotary member is disengaged therefrom at a tooth corresponding to the number of the instrument, a lever connected with the pawl to receive motion therefrom, a dog carried by the lever, a ratchet wheel engaged by the dog, and a driving connection between the ratchet wheel and the spring motor by means of which the spring motor is caused to be rewound by the movements of the pawl.

19. A selective signaling device, comprising a suitably operated pawl, a suitably driven motor shaft, a rotary member receiving motion from the motor shaft and having escapement teeth engaged by the pawl, means for disengaging the rotary member from the pawl, a signaling member in position to be engaged by the pawl when the rotary member is disengaged therefrom at the tooth corresponding to the number of the instrument, a cam on the motor shaft, and a double switch actuated by the cam for opening and closing electrical circuits by the movements of the motor shaft.

20. A selective signaling means, comprising a magnet, a pawl operated thereby, a motor driven shaft, a rotary member receiving motion from the motor shaft and having escapement teeth engaged by the pawl, means for disengaging the pawl from the rotary member, a signaling member in position to be engaged by the pawl when the rotary member is disengaged therefrom at the tooth corresponding to the number of the instrument, a cam on the motor shaft, a double switch actuated by the cam, a main line circuit, a branch circuit including the magnet and connected by one side of the double switch to the main line circuit in the normal position of the parts, and a local signal circuit including the signaling member and a bell or the like and connected by the other side of the double switch to the main line circuit in another position of the parts.

21. A selective signaling device, comprising a suitably operated pawl, a motor driven shaft, a rotary member mounted on the shaft and having a flexible connection therewith to receive motion therefrom, said rotary member having escapement teeth to be engaged by the pawl, means on the motor shaft for engaging the pawl and the rotary member to hold the motor shaft and the rotary member in a normal position and having play on the motor shaft to permit the rotary member to move faster under the escapement of the pawl than the movement of the motor shaft, means for disengaging the rotary member from the pawl, and a signaling member in position to be engaged by the pawl to produce a signal when the rotary member is disengaged therefrom at the tooth corresponding to the number of the instrument.

22. A selective signaling device, comprising a suitably operated pawl, a motor driven shaft, a rotary member mounted on the shaft and having a flexible connection therewith to receive motion therefrom, said rotary member having escapement teeth to be engaged by the pawl, a starting arm having a limited rotary play on the motor shaft and adapted to engage the pawl and the rotary member to hold the motor shaft and the rotary member in a normal position and being adapted to drop when released by the pawl, to take a lead which will permit the rotary member to move under the escapement at a greater speed than the movements of the motor shaft, means for disengaging the rotary member from the pawl, and a signaling member in position to be engaged by the pawl to produce a signal when the rotary member is disengaged therefrom at the tooth corresponding to the number of the instrument.

23. A selective signaling device, comprising a suitably operated pawl, a motor driven shaft, a rotary member mounted on the shaft and having a flexible connection therewith to receive motion therefrom, said rotary member having escapement teeth to be engaged by the pawl, means for disengaging the rotary member from the pawl, a signaling member in position to be engaged by the pawl when the rotary member is disengaged therefrom at the tooth corresponding to the number of the instrument for producing a signal, and means for positively connecting the rotary member with the motor shaft to disengage the signaling member from the pawl.

24. A selective signaling device, compris-

ing a suitably operated pawl, a motor driven shaft, a rotary member mounted on the shaft and having a spring connection therewith to receive motion therefrom, said rotary member having escapement teeth to be engaged by the pawl, means for disengaging the rotary member from the pawl, a signaling member in position to be engaged by the pawl when the rotary member is disengaged therefrom at the tooth corresponding to the number of the instrument for producing a signal, a pin on the rotary member, and a lug on the motor shaft to engage the pin for permitting the motor shaft to positively drive the rotary member to disengage the signaling member from the pawl when the action of the spring is insufficient for the purpose.

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

IRA F. MANNY.

Witnesses:

ALBERT V. BINGEL,

WALDEMAR KREMER.
