

No. 609,309.

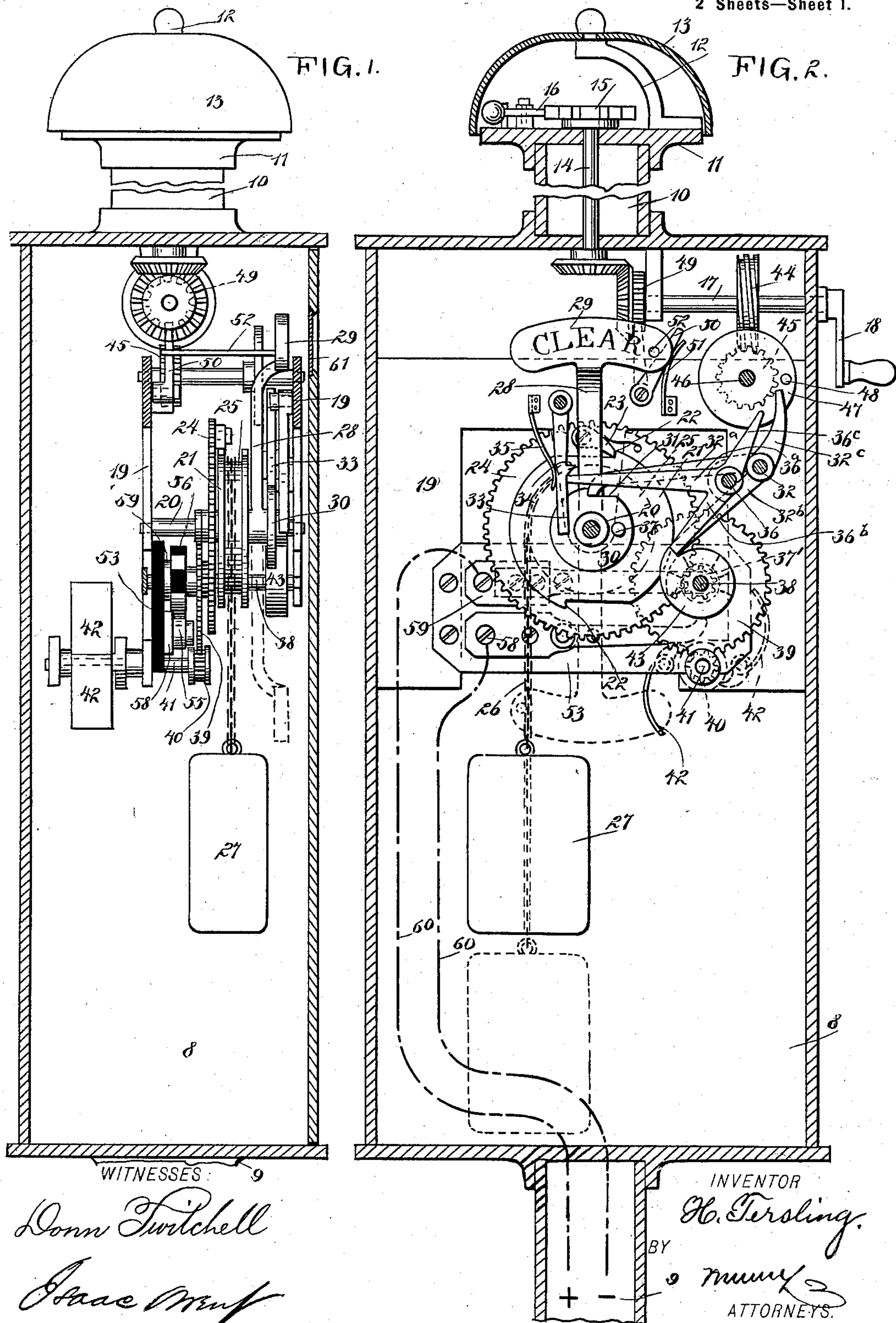
Patented Aug. 16, 1898.

H. TERSLING.
FIRE ALARM.

(Application filed Mar. 15, 1897.)

(No Model.)

2 Sheets—Sheet 1.



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FIG. 3.

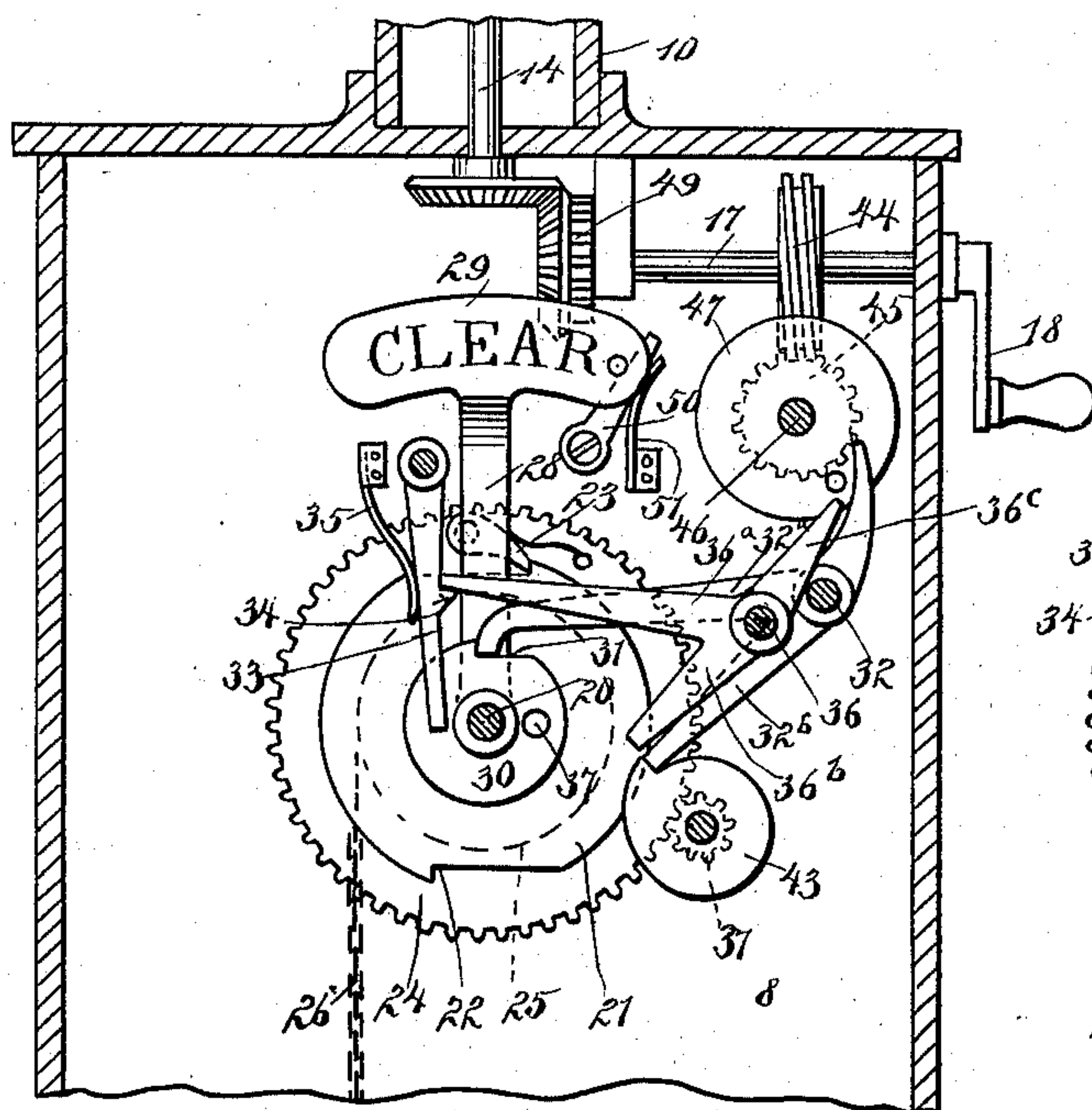


FIG. 4.

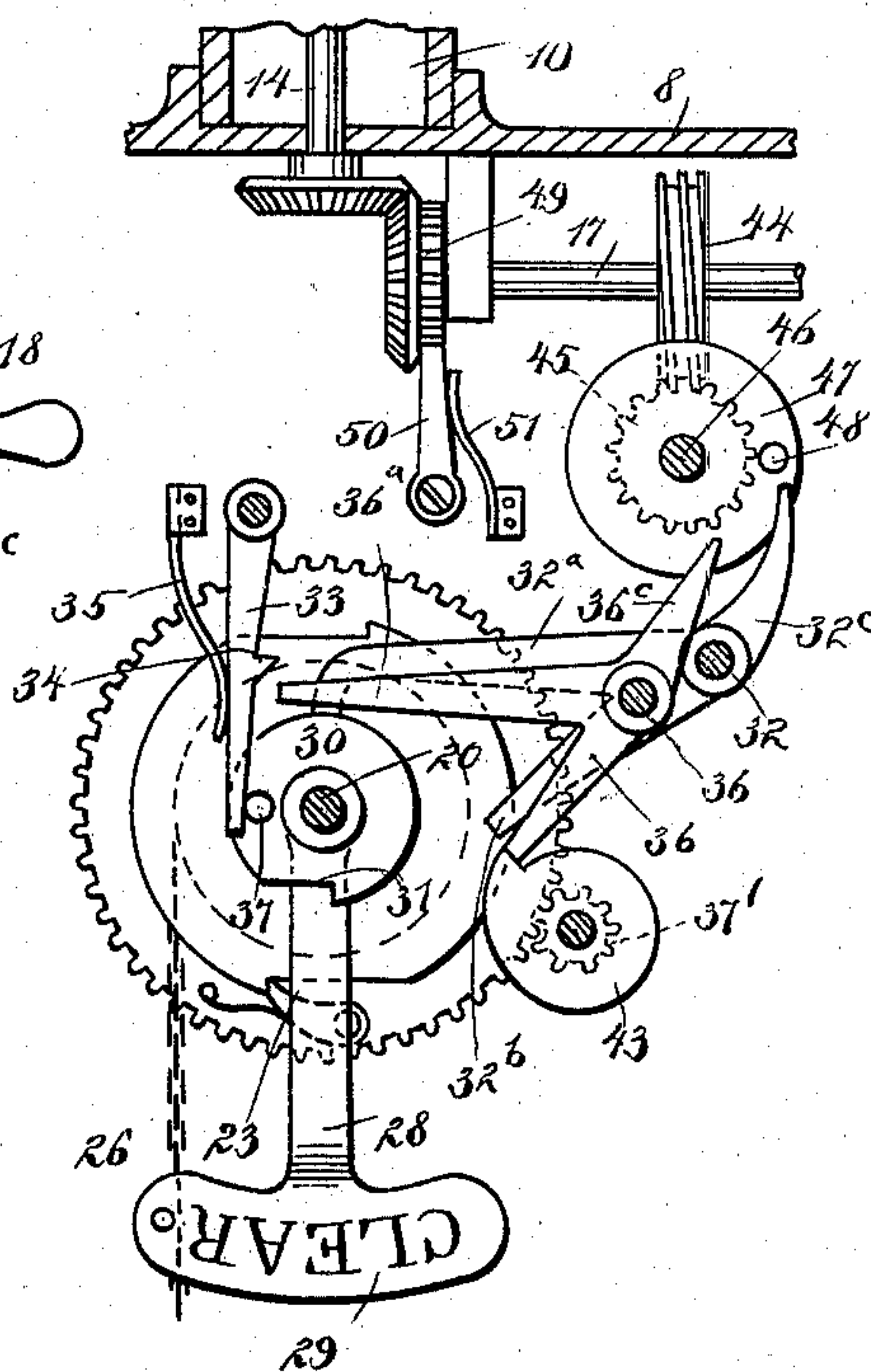


FIG. 5.

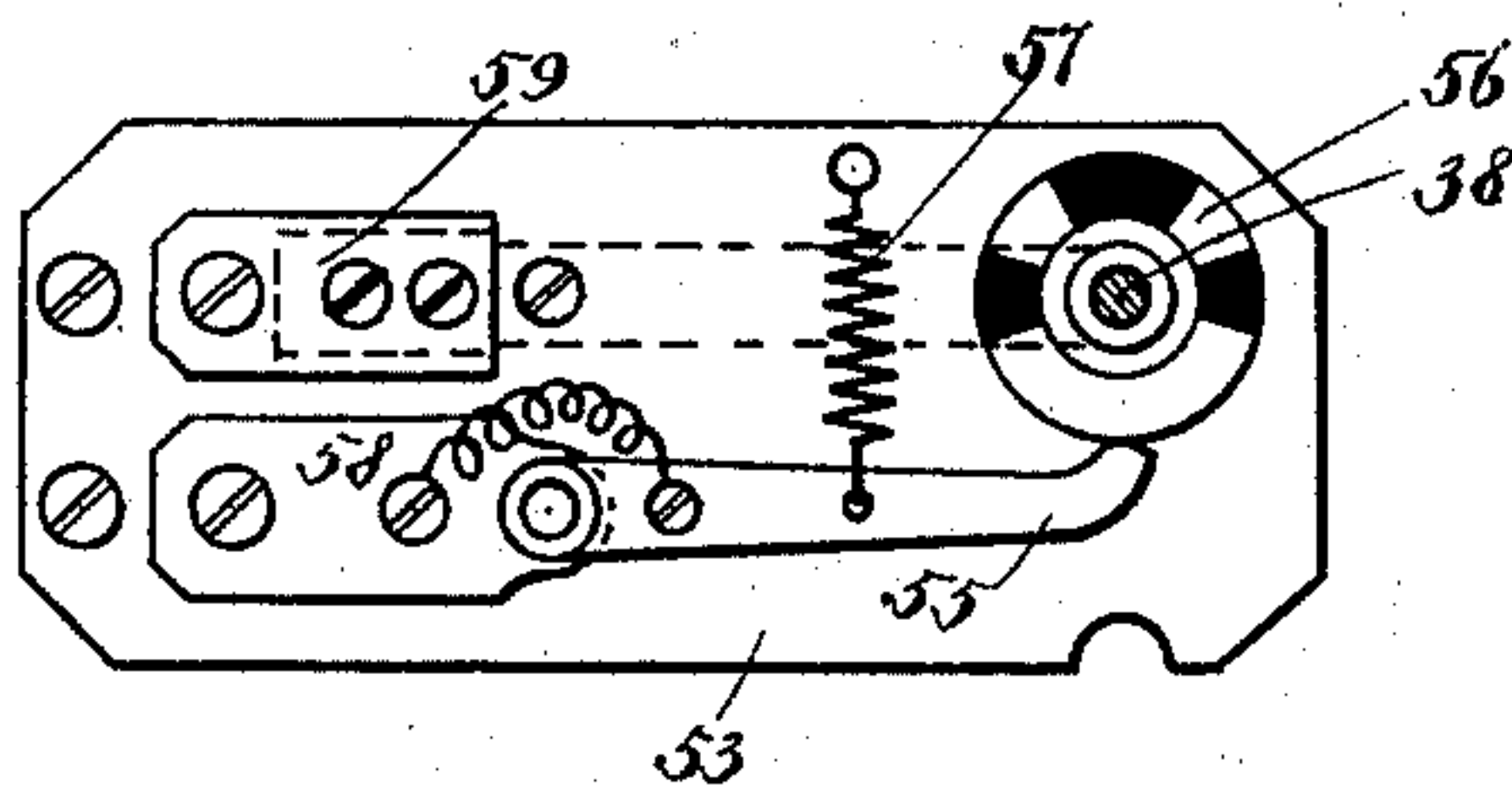


FIG. 6.

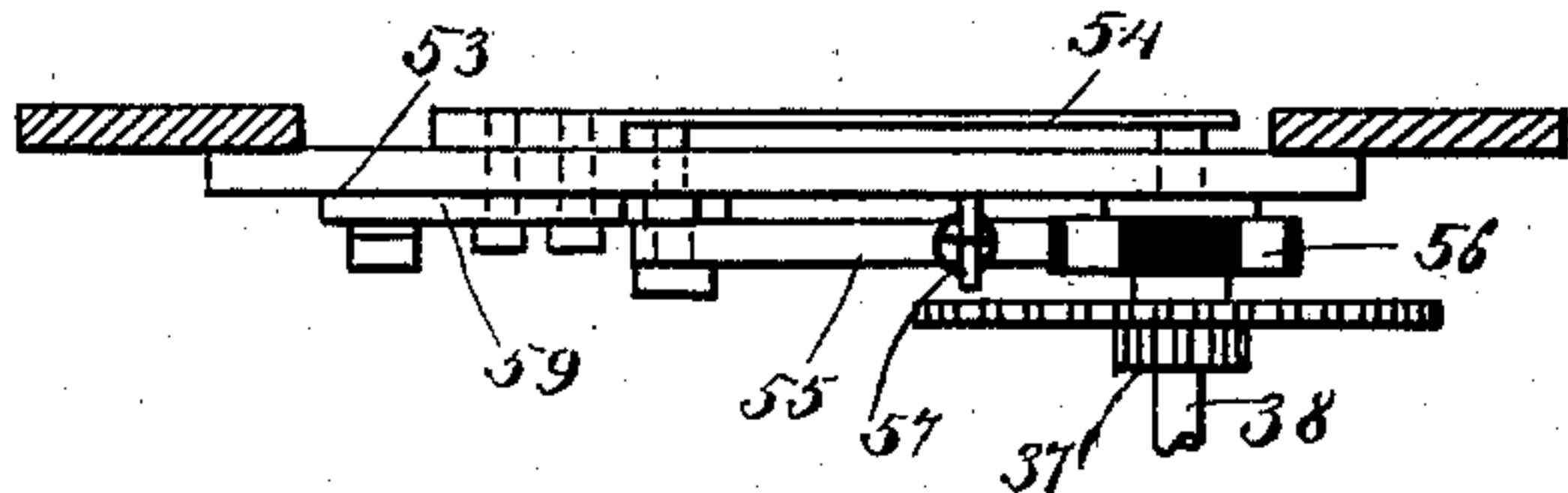
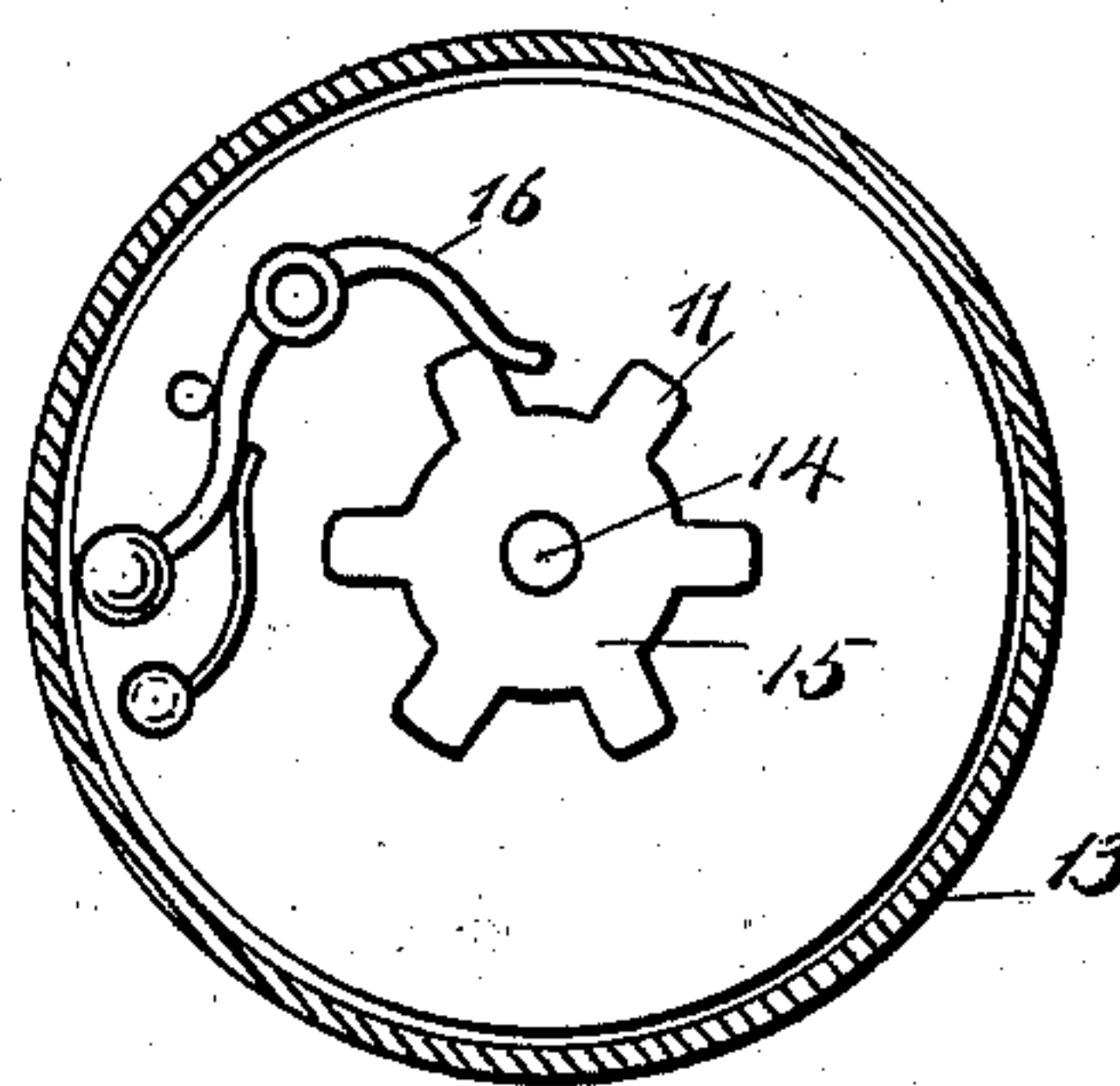


FIG. 7.



WITNESSES:

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HILMAR TERSLING, OF COPENHAGEN, DENMARK, ASSIGNOR TO JOHANNES CAROE, NIELS SCHMITH, AND EMIL SCHIEMANN, OF SAME PLACE.

FIRE-ALARM.

SPECIFICATION forming part of Letters Patent No. 609,309, dated August 16, 1898.

Application filed March 15, 1897. Serial No. 627,549. (No model.) Patented in Norway May 15, 1896, No. 4,999, and in Germany May 19, 1896, No. 89,580.

To all whom it may concern:

Be it known that I, HILMAR TERSLING, a subject of the King of Denmark, and a resident of Copenhagen, Denmark, have invented a new and useful Improvement in Fire-Alarms, (for which I have obtained Letters Patent in Norway, No. 4,999, dated May 15, 1896, and in Germany, No. 89,580, dated May 19, 1896,) of which the following is a specification.

10 This invention is a fire-alarm constructed to reduce to a minimum the danger of sounding false alarms, and it is characterized by a mechanical alarm sounding in the immediate vicinity and by a mechanism moving in unison with the mechanical alarm, whereby an electrical circuit is influenced to sound a distant alarm.

20 This specification is the disclosure of one form of my invention, while the claims define the actual scope of the invention.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

25 Figure 1 is a vertical section taken through the casing and showing the mechanism in edge elevation. Fig. 2 is a vertical section taken through the casing and showing the mechanism in front elevation. Fig. 3 is a detail diagrammatic front elevation illustrating the action of the invention. Fig. 4 is a similar view with the parts in a different position. Fig. 5 is a front elevation of the circuit-closing device. Fig. 6 is a plan view thereof, and Fig. 30 7 is a sectional plan showing the mechanical alarm.

40 The casing 8 is supported on a column 9 and has a column 10 rising therefrom to any desired height. The upper end of the column 10 is provided with a head 11, whereon stands an arm 12, that carries a ball 13. Mounted to turn in the head 11 and in the top of the casing 8 is a shaft 14, which extends above the head and is provided with a star-wheel 15, engaging a spring-pressed clapper-lever 16, whereby the bell 13 is sounded. Mounted in the upper portion of the casing 8 is a revolvable shaft 17, which is connected by bevel-gearing with the shaft 14 and which has one 45 end projected out of the casing 8 and provided

with a crank-arm 18, by which the shaft 17 may be turned. The revolution of the shaft 17 sounds the alarm-bell 13.

A suitable frame 19 is mounted in the casing 8 and carries the mechanism for turning 55 on the long-distance alarm. The frame 19 has a shaft 20 mounted revolvably therein. This shaft 20 fixedly carries a disk 21, which is provided with two oppositely-disposed shoulders 22. These shoulders are adapted 60 to be alternately engaged by a pawl 23, carried on a spur-gear 24, which is loose on the shaft 20. The disk 21 carries a drum 25, as shown in Fig. 1, whereover passes a chain 26, carrying a weight 27, movable vertically in 65 the lower portion of the casing 8. Fixed to the shaft 20 is an arm 28, provided with a head 29, on which is produced the word "Clear," the purpose of which will hereinafter appear. Fixed to the shaft 20 is a disk 70 30, provided with a recessed portion 31, forming a shoulder adapted to be engaged by the arm 32^a of the three-armed pawl 32. Hung from the frame 19 is an arm 33, which has a shoulder 34 formed thereon and which is 75 pressed by a spring 35. The arm 33 coacts with the arm 36² of the pawl 36. The pawls 32 and 36 are respectively mounted on pins carried by the frame 19. The disk 30 is provided with a pin 37, projecting forwardly from 80 the face of the disk and adapted to engage the arm 33 and push the same leftward in Fig. 2, so that the arm 36^a of the pawl 36 will be deprived of the support of the shoulder 34 and the arm 36^a will drop. 85

The gear 24 meshes with a pinion 37', fixed on a shaft 38, which is mounted in the frame 19. This shaft carries a spur-gear 39, which meshes with a pinion 40, fixed on a shaft 41, also mounted in the frame 19 and carrying 90 regulator-fans 42 for acting upon the atmosphere and restraining the movement of the shaft 41, as will be understood. The shaft 38 is provided with a disk 43, against which the arms 32^b and 36^b, respectively, bear. The 95 disk 43 is provided with one shoulder or ratchet-tooth which is adapted to be engaged by the arms 32^b and 36^b, whereby to stop the disk 43, and consequently the shafts 38 and 20, from revolving. 100

The shaft 17 is provided with a worm 44, meshing with a worm-gear 45, fixed to a shaft 46, mounted in the frame 19. The shaft 46 carries a disk 47, provided with a pin 48. This pin 48 is adapted to successively strike the arms 32° and 36° of the pawls 32 and 36, whereby to throw the arms 32° and 36° downward and raise the other arms of the pawls. The shaft 17 is provided with a notched wheel 49, adapted to be engaged by a locking-arm 50, mounted on the frame 19 and pressed by a spring 51. The head 29 of the arm 28 is provided with a pin 52, projecting transversely therefrom and normally engaging the arm 50, whereby to hold the arm normally away from the wheel 49. When the arm 28 swings to the leftward in Fig. 2, in company with the shaft 20, the pin 52 is disengaged from the arm 50 and the spring 51 permitted to throw the arm 50 in engagement with the wheel 49, thus locking the shaft 17 and stopping the action of the clapper-lever 16.

The circuit-closing apparatus is shown in detail in Figs. 5 and 6, and its position with reference to the other parts of the machine is shown in Figs. 1 and 2. This device consists in an insulated plate 53, on each side of which is carried a contact arm or brush 54 and 55. The arm or brush 54 is normally engaged with the rear end of the shaft 38, so as to be in electrical connection therewith. The shaft 38 passes through the plate 53 and carries a commutator 56, which is engaged by the brush 55. This brush 55 is hinged to a contact-plate 58 on the main plate 53 and drawn against the commutator by means of a retractile spiral spring 57. The brush 55 is in electrical connection with a contact-plate 59, similar to the plate 58. From these plates 58 and 59 electrical conductors 60 pass downward through the casing 8 and column 9 to the distant signal. The shaft 38, revolving under the action of the gears 27 and 34, turns the commutator 56 rapidly, and this, with the brushes 54 and 55, causes an alternate make and break of the circuit. By these means the alarm is sent over the conductors 60 to the distant station.

The parts of my invention being thus constructed and assembled, the operation thereof may be traced as follows: Figs. 2 and 3 show the elements in their normal positions. Assuming that the apparatus be thus disposed and that a person desires to sound an alarm, the crank 18 should be turned in such a direction as to move the disk 47 in the direction of the arrow applied thereto in Fig. 2. The turning of the shafts 17 and 14 sounds the alarm 13, and the person turning the crank 18 is thus warned that a distant alarm is about to be given. The sounding of the alarm 13 continues until the pin 48 of the disk 47 engages the arm 36° of the pawl 36. This throws the arm 36° down and lifts the arm 36° until it is supported on the shoulder 34 of the arm 33. The arm 36° is also lifted out of engagement with the shoulder on the disk 43.

Immediately after this the arm 32° is thrown down by the pin 48, and the arm 32° is lifted out of engagement with the shoulder of the disk 43. The disk 43 is therefore free to turn, and the weight 27, acting on the drum 25, causes the shaft 20 to turn from right to left in Fig. 2. The shaft 20 carries with it the fixed disk 21, the disk 30, the arm 28, and, through the medium of the pawl 23, the loose spur-gear 24. The arm 28 swings down to the position shown by full lines in Fig. 4 and by dotted lines in Fig. 2. When this has occurred, the arm 32° rests on the periphery of the disk 30, and thereby holds the arm 32° out of engagement with the disk 43. The turning of the wheel 24 drives the shaft 38, and thus turns the commutator 56 to transmit the signal abroad. As the arm 28 swings from its position in Figs. 2 and 3 the rod 52 releases the lock-arm 50 and the shaft 17 is held against the manual force that is applied to the crank 18. Up to this point in the operation the alarm has been sounded both in the vicinity and in the distance, and it is next necessary to stop the apparatus. When the arm 32° moves from the disk 43 and permits the weight 27 to drop, the disk 30 turns from right to left in Figs. 2, 3, and 4, and when the recess 31 moves away from the arm 32° the arm 32° is held up by engaging the periphery of the disk 30. The arm 36° had previously been engaged with the shoulder 34; but as soon as the pin 37 turns over to the position shown in Fig. 4 the arm 33 will be moved leftward in said figure and the arm 36° will be left without support, whereupon the pawl 36 will drop and the arm 36° will engage with the shoulder on the disk 43. This stops the action of the machine. Fig. 4 shows the parts when stopped. It now remains simply to wind or set the apparatus for a second operation. This is done by turning back the arm 28 to the normal position, which is that shown in Figs. 1, 2, and 3. This reverses the disk 30 and causes the arm 32° again to drop into the recess 31 and also causes the disk 21, with its drum 25, to turn back, leaving the gear 24 stationary. This operation results in the shifting of the pawl 23 from one of the shoulders 22 to the other. As the arm 23 turns to its normal position the pin 52 engages the locking-arm 50 and disconnects the same from the wheel 49. This leaves the apparatus in position for a second operation. The casing 8 is provided with a window 61, through which the head 29 of the arm 28 may be seen when the head is in normal position. The word "Clear" being visible, therefore, through the window 61 informs an intended signaler that the apparatus is in proper adjustment. For the purpose of winding or resetting the apparatus the casing 8 may be provided with a suitable door.

In connection with the foregoing description it will be observed that the two pawls 32 and 36 have a certain essential coaction and that each performs its specific duty in

the operation of the apparatus. The pawl 36 serves to stop the movement of the disk 43, since the pawl 36 is the first to drop after having been raised by the pin 48. The pawl 32 is the last to disengage the disk 43 under the action of the pin 48. The pawl 32 also serves to stop the return movement of the disk 30.

Having now particularly described and ascertained the nature of my invention and in what manner the same is to be performed, I declare that what I claim is—

1. The combination with a casing, of a crank-shaft projecting out thereof, an alarm, gearing connecting the alarm with the crank-shaft and driving the alarm therefrom, electric-circuit-closing mechanism, a motor for operating the same, the motor being controlled by the crank-shaft, and a stop-pawl released by the movement of said circuit-closing mechanism and engaging the gearing for operating the alarm whereby to stop the alarm.

2. The combination with a casing, of a crank-shaft mounted therein, an alarm geared with the crank-shaft and driven thereby, an electric-circuit-closing apparatus, a motor for operating the same, a restraining-pawl for the motor, the pawl being controlled by the crank-shaft, and a stop-pawl for the alarm, the stop-pawl being released by the circuit-closing mechanism.

3. The combination with a support, of a shaft revolubly mounted therein, an alarm driven mechanically from the shaft, a lock-arm capable of restraining the movement of the shaft, a disk driven by the shaft and having a pin thereon, a pawl tripped by the pin of the disk, a swinging arm normally engaging the lock-arm to hold the same inactive, a motor in connection with said arm, gearing also in connection with the arm, the gearing being restrained by the pawl, and an electrical-circuit controller driven from the gearing.

4. The combination of a revoluble disk having a tripping-pin, two three-armed pawls successively tripped by said pin, a shaft, a motor in connection with the shaft to turn the same, a disk fixed to the shaft and having a shoulder engaged by one of the pawls, a supporting-arm adjacent to one arm of the other pawl and serving to support the same, a pin fixed to the disk of the shaft and serving to trip the supporting-arm, gearing in connection with the shaft, and a disk having a shoulder engaged by one arm of each pawl and being in connection with said gearing.

5. The combination of a shaft, a motor in connection therewith, a disk fixed thereto and having a shoulder and also having a pin, a supporting-arm hung adjacent to the disk and having a shoulder, two pawls, one pawl having an arm coacting with the shoulder of the supporting-arm and the other pawl having an arm bearing on the disk, a second shaft, gearing connecting the two shafts, and a second disk fixed to the second shaft and

having a shoulder, and each pawl having an additional arm bearing against said shoulder of the second disk.

6. The combination of a three-armed pawl, means for tripping one arm of said pawl, a member restrained by a second arm of the pawl, and a supporting-arm having a shoulder capable of holding the third arm of the pawl.

7. The combination of a three-armed pawl, one arm of which serves to permit the tripping of the pawl, a member restrained by the second arm of the pawl, and a supporting-arm having a shoulder whereby to hold the third arm of the pawl.

8. The combination of a three-armed pawl, one arm of the pawl serving to permit the tripping of the pawl, a member restrained by the second arm of the pawl, and a disk having a notch, the disk being engaged by the third arm of the pawl and the notch serving to regulate the position of the pawl with reference to said member.

9. The combination of a three-armed pawl, one arm of which serves to permit the tripping of the pawl, a member restrained by the second arm of the pawl, a supporting-arm having a shoulder engaged by the third arm of the pawl, and a disk mounted to turn in the vicinity of the supporting-arm and provided with a pin whereby to trip said supporting-arm.

10. The combination of two three-armed pawls, one arm of each pawl serving to permit the tripping thereof, a member held by the second arm of each pawl, a supporting-arm mounted adjacent to the third arm of one of the pawls and having a shoulder whereby to support said third arm, and a disk against which the third arm of the remaining pawl bears, such disk having a peripheral notch and the disk also having a pin capable of tripping the supporting-arm.

11. The combination of a driven shaft, a disk fixed to the shaft and having a shoulder and also having a pin, gearing in connection with the shaft and serving to transmit a distant alarm, a pawl pivoted adjacent to the disk and bearing on the periphery thereof, a second pawl adjacent to the first pawl, means coacting with the pin and serving temporarily to hold the second pawl raised, a local alarm, a revoluble shaft geared with the local alarm and serving to drive the same, and a second disk controlled by said revoluble shaft and engaged by both pawls and the pin serving to trip the second-named pawl.

12. The combination of a driven shaft, gearing in connection therewith and serving to transmit a distant alarm, a disk fixed to the shaft and having a shoulder thereon and also having a pin, two pawls pivoted adjacent to the shaft, one of the pawls having an arm bearing against the shoulder of the disk, an arm pivoted adjacent to the shaft and having a shoulder serving normally to support the other pawl, means for successively tripping

the pawls and a disk connected with said gearing, the disk having a shoulder coacting with an arm on each of the pawls.

13. The combination of a revoluble and
5 driven shaft, gearing in connection with such shaft and comprising a shouldered disk, a second shouldered disk, the second shouldered disk being fixed to the shaft, a three-armed
10 pawl, two arms of said pawl bearing respectively on the two shouldered disks, and means for tripping the pawl, such means coacting with the third arm thereof.

14. The combination of a driven shaft, gearing in connection therewith and comprising
15 a shouldered disk, a shouldered disk fixed to the shaft, two three-armed pawls, each pawl having two of its arms coacting respectively with the disks, an arm pivoted adjacent to one of the pawls and having a shoulder on
20 which one arm of said pawl bears, a pin fixed to the disk of the shaft and serving to throw the pivoted arm and means for successively tripping the pawls through the medium of the remaining arms thereof.

25 15. In a fire-alarm, the combination of a casing, a motor therein, means for restraining the motor, gearing comprising a crank located outside of the casing, by which gearing the

said means are actuated to release the motor, an arm in connection with the motor and
30 mounted to swing as the motor operates, the arm serving to indicate the condition of the apparatus, and means for locking said gearing, such locking means being controlled by the arm, so that as the arm moves with the
35 motor, the locking means act to stop the said gearing.

16. In a fire-alarm, the combination with a casing, of a motor in the casing, a local alarm
40 carried by the casing, a crank-shaft geared with said alarm, gearing for transmitting a distant alarm, a pawl serving to connect the gearing with the motor, an arm in connection with the motor and moving with the same, a
45 pawl restraining the motor, and means in connection with the crank-shaft to operate the pawl to release the motor.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 19th day of November, 1896.

HILMAR TERSLING.

Witnesses:

CHARLIE HUDE,
JULES BLOM.