

(No Model.)

3 Sheets—Sheet 1.

F. D. HOEHL.  
ALARM CLOCK.

No. 606,143.

Patented June 21, 1898.

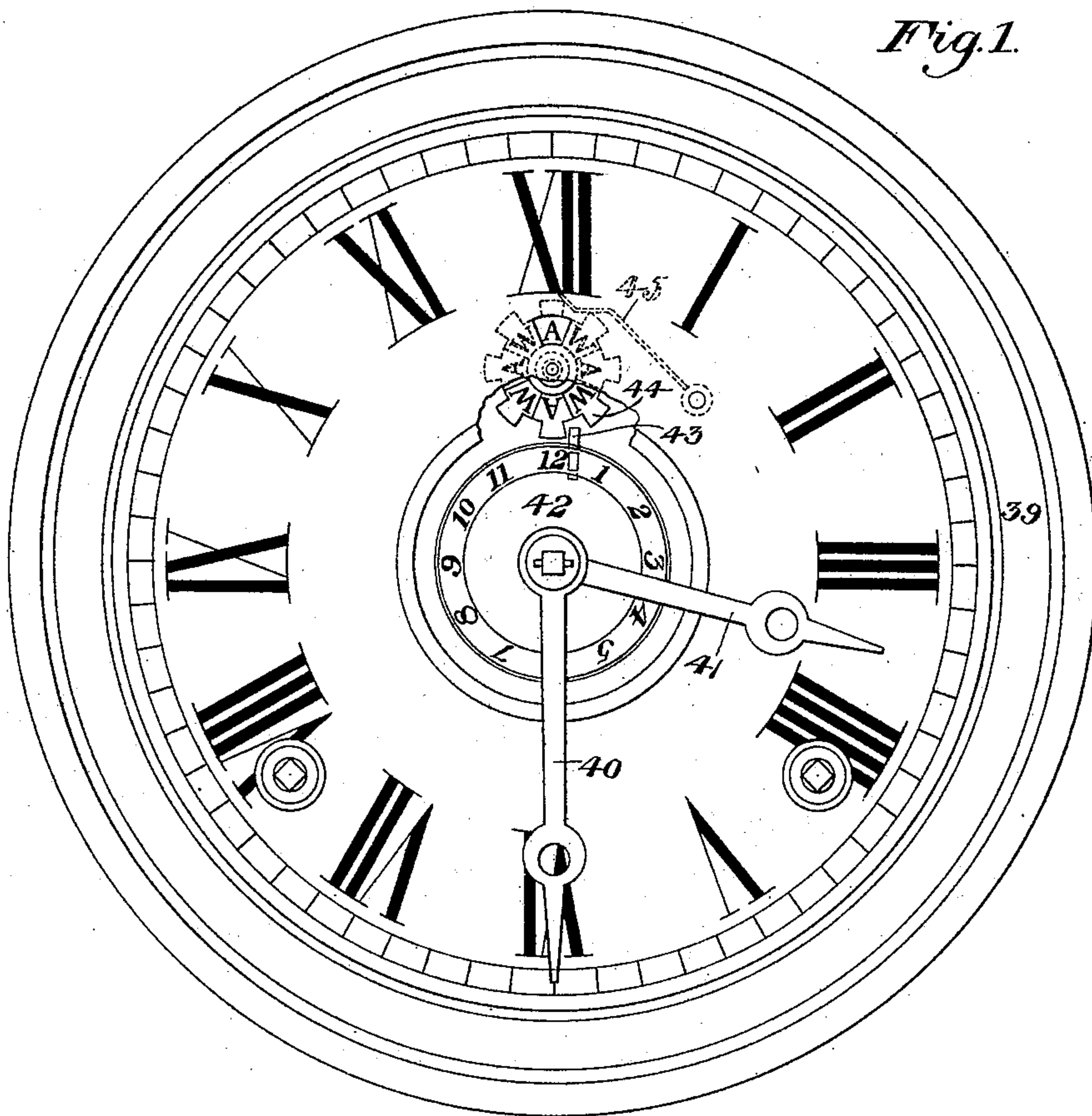


Fig. 1.

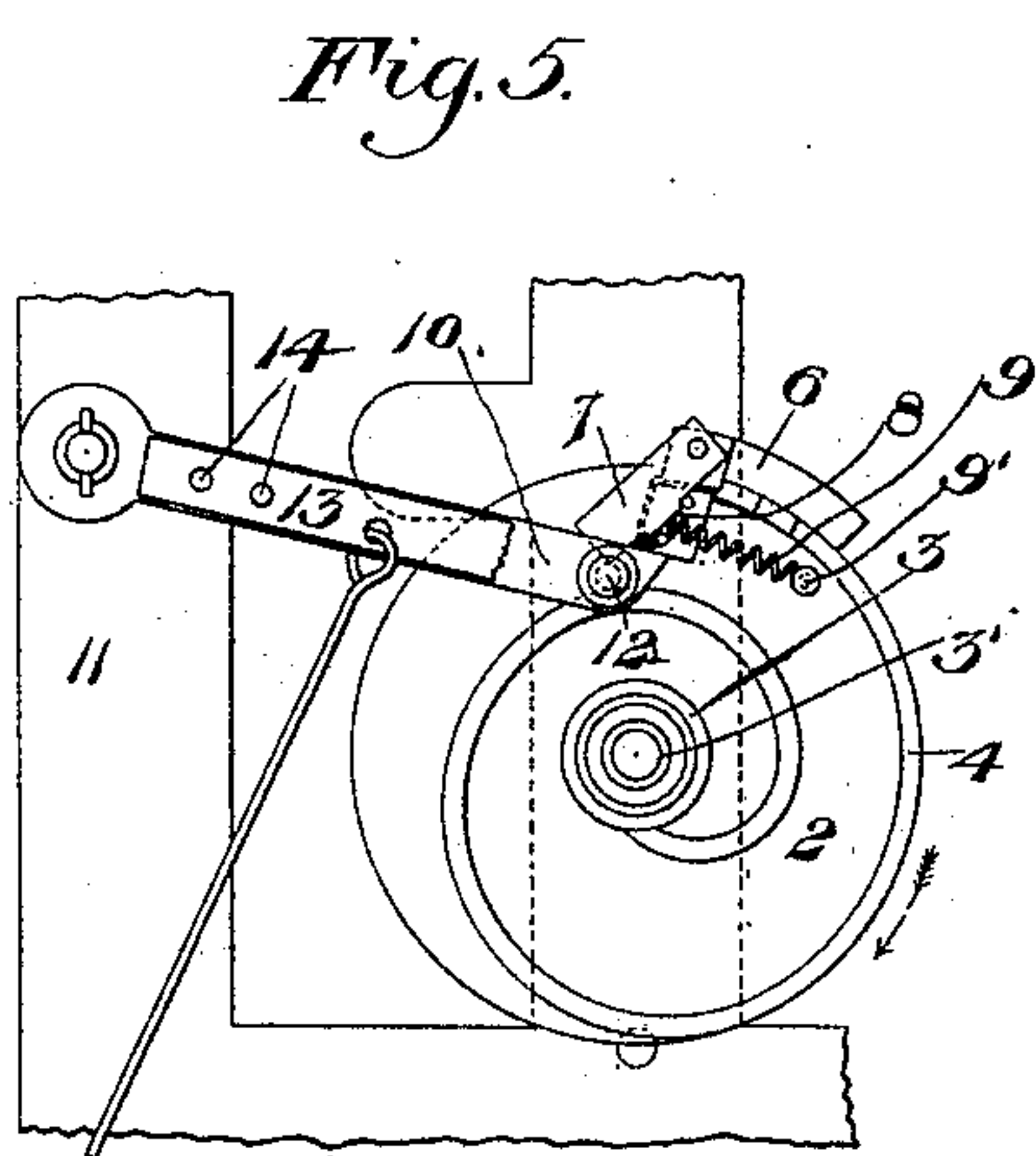


Fig. 5.

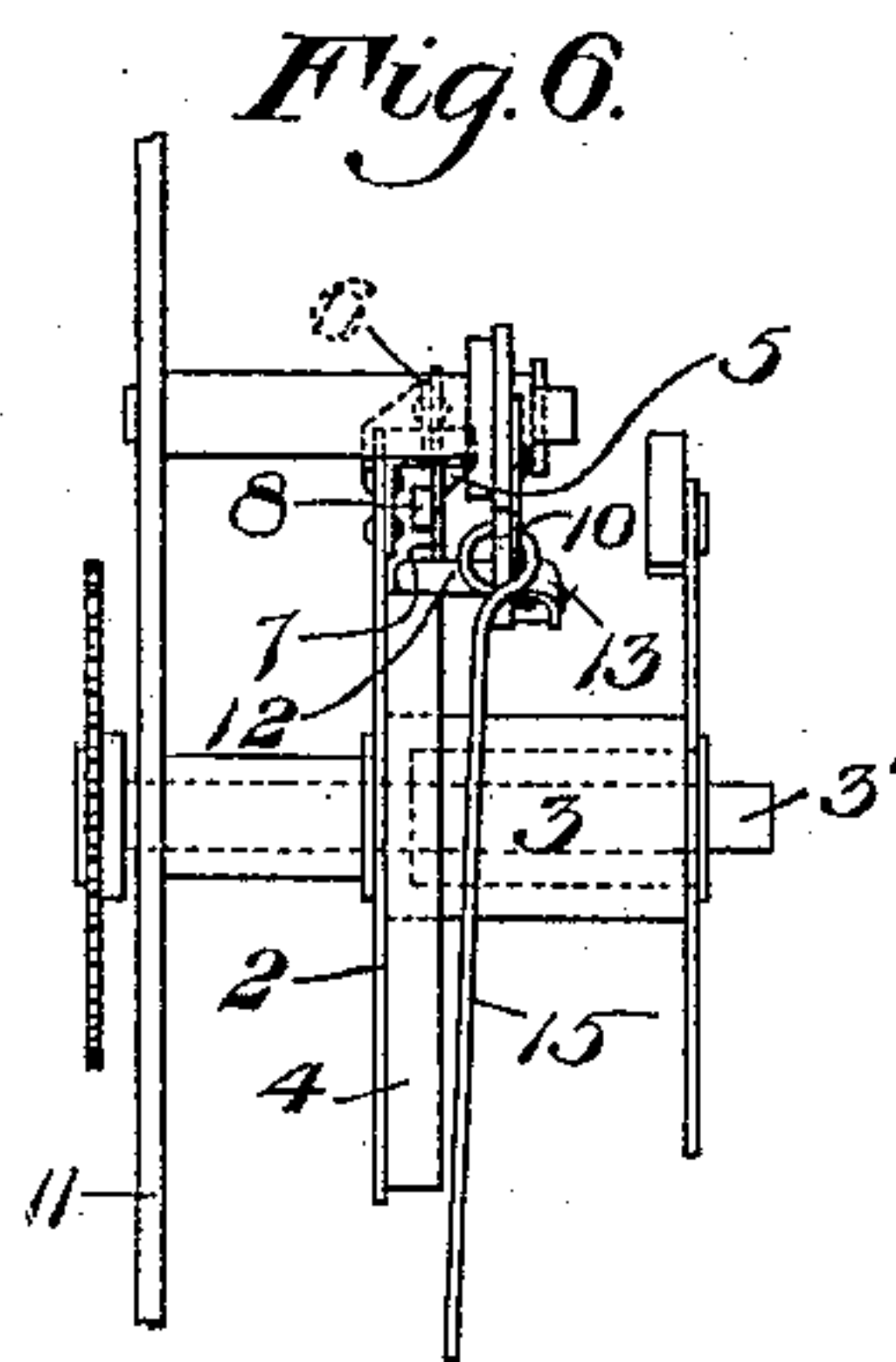


Fig. 6.

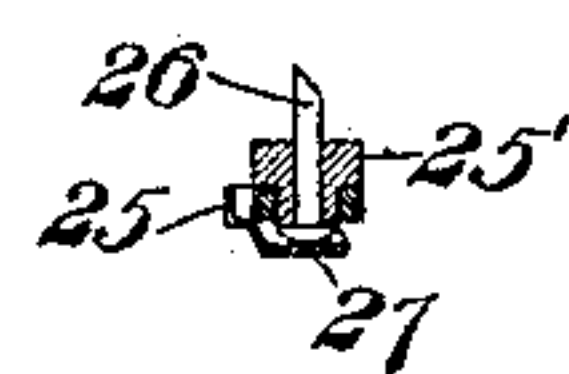


Fig. 4.

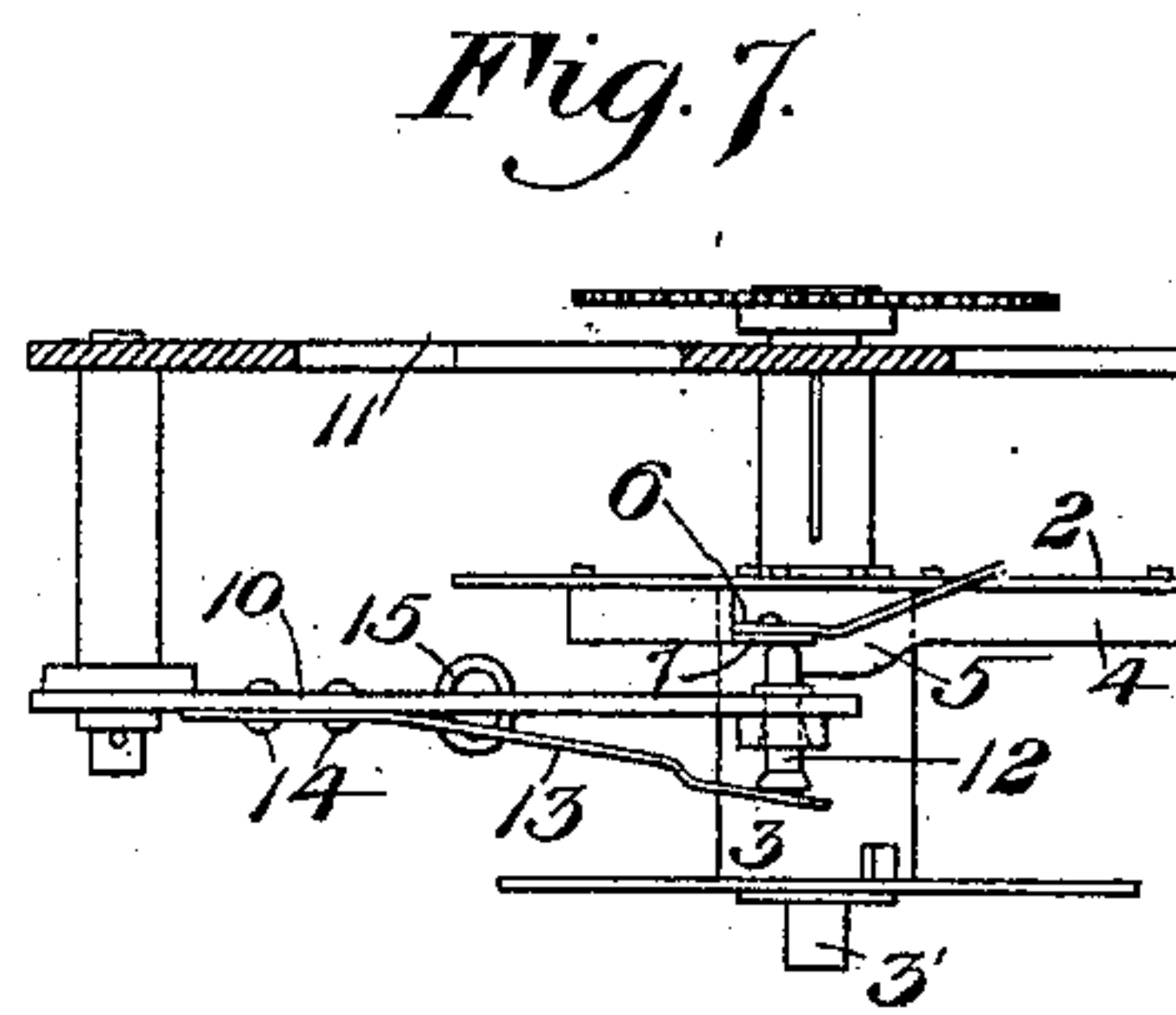


Fig. 7.

WITNESSES

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(No Model.)

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Fig. 2.

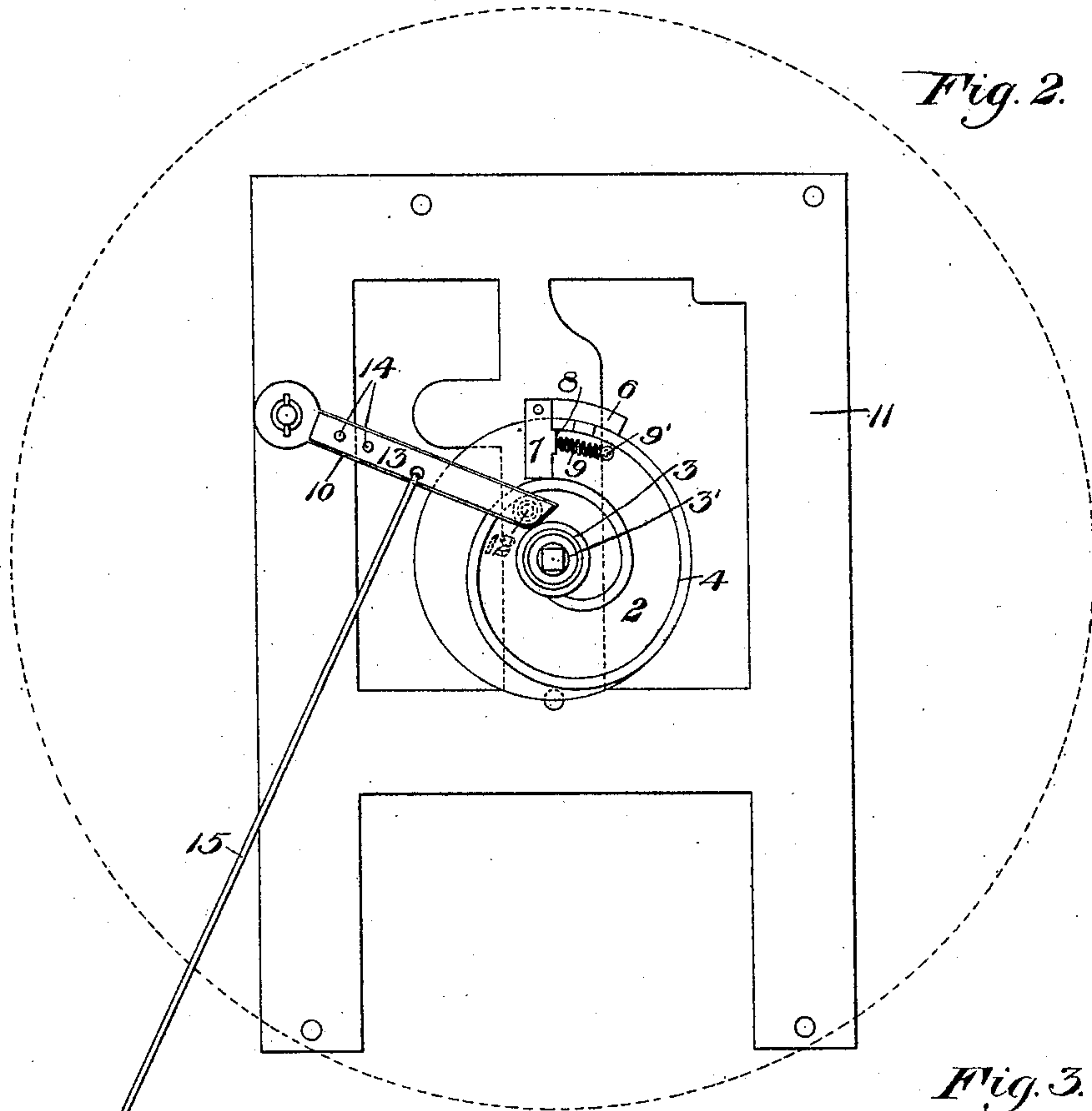
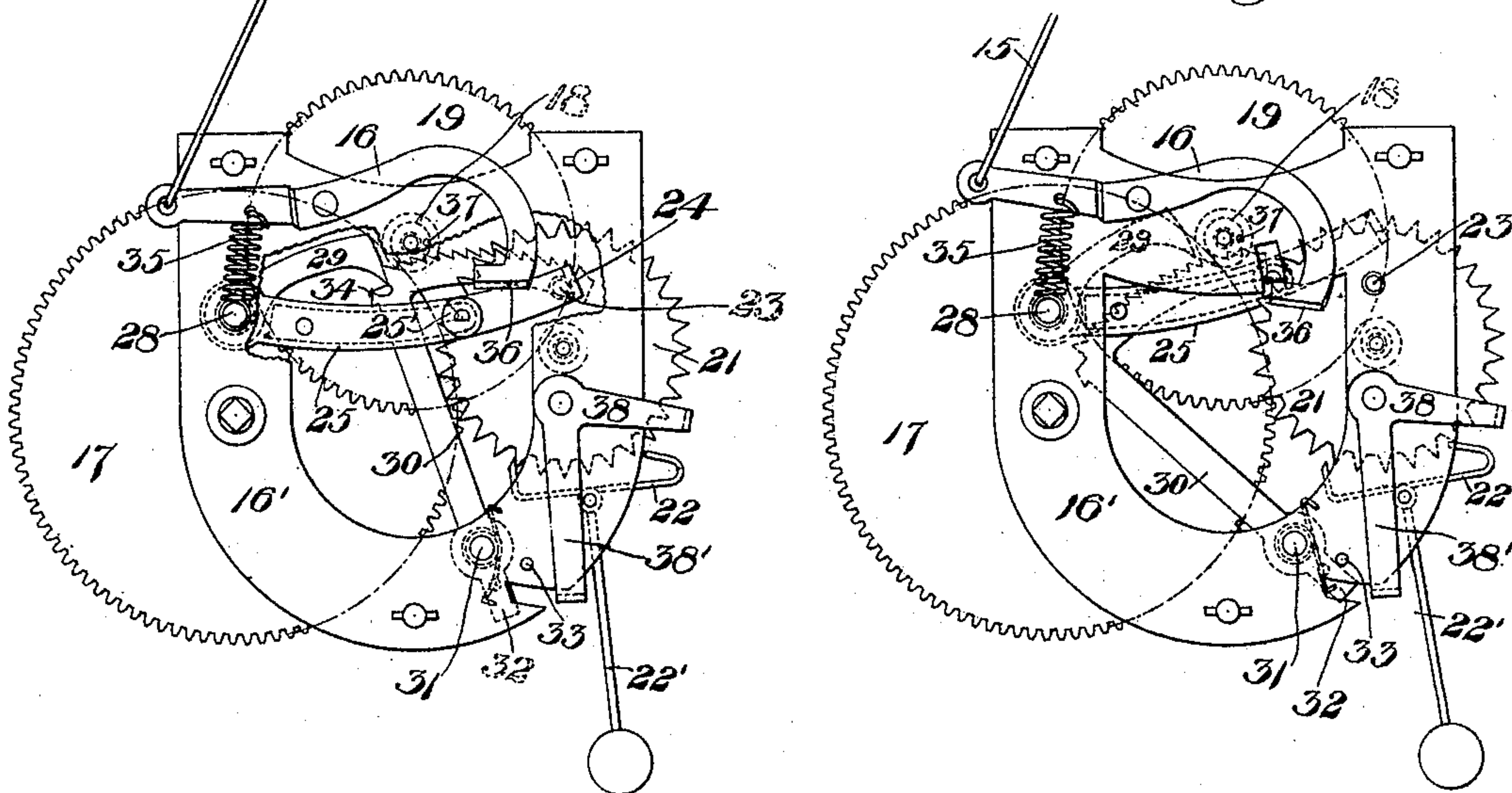


Fig. 3.



WITNESSES

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3 Sheets—Sheet 3.

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Fig. 13.

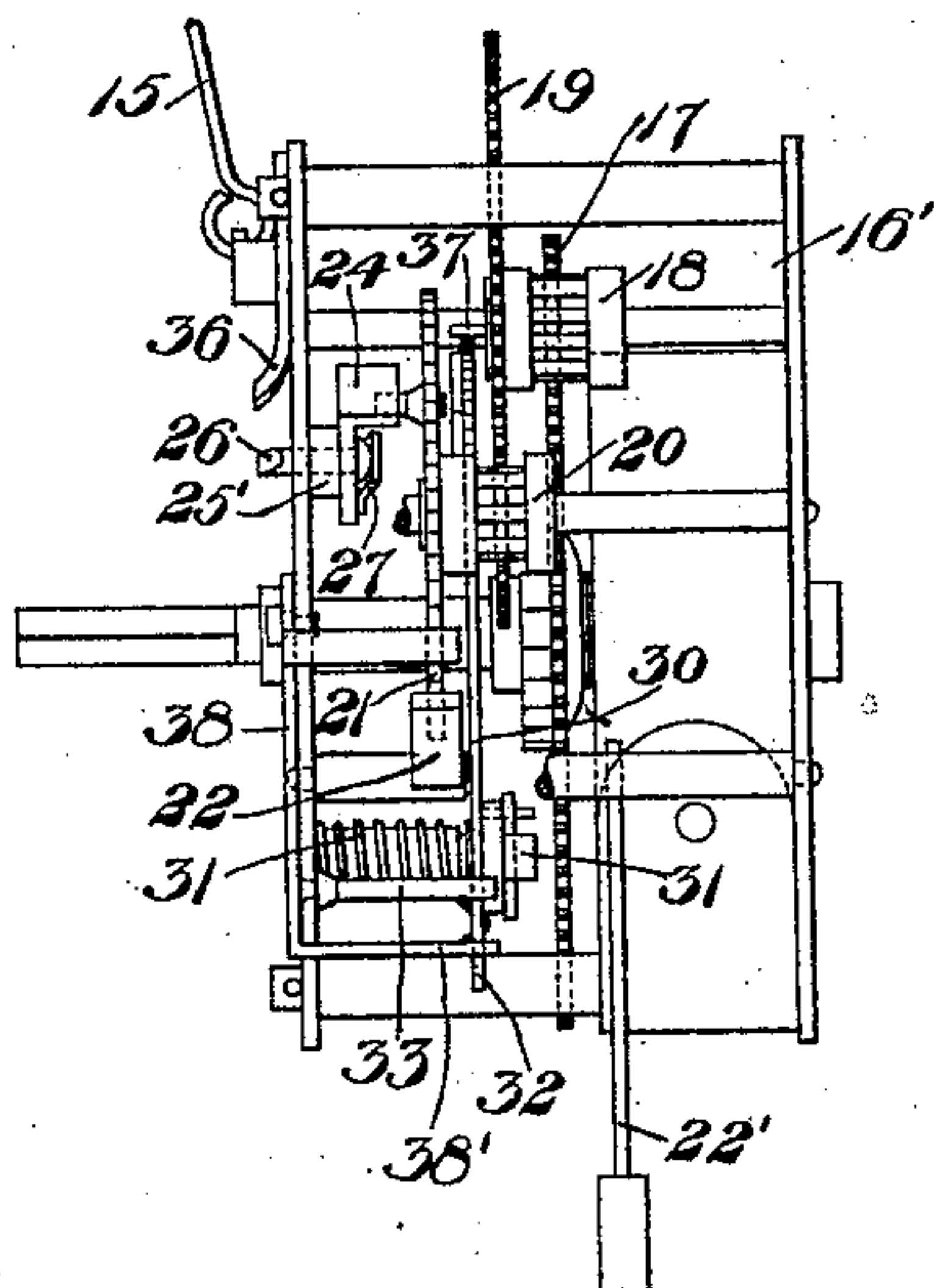


Fig. 15.

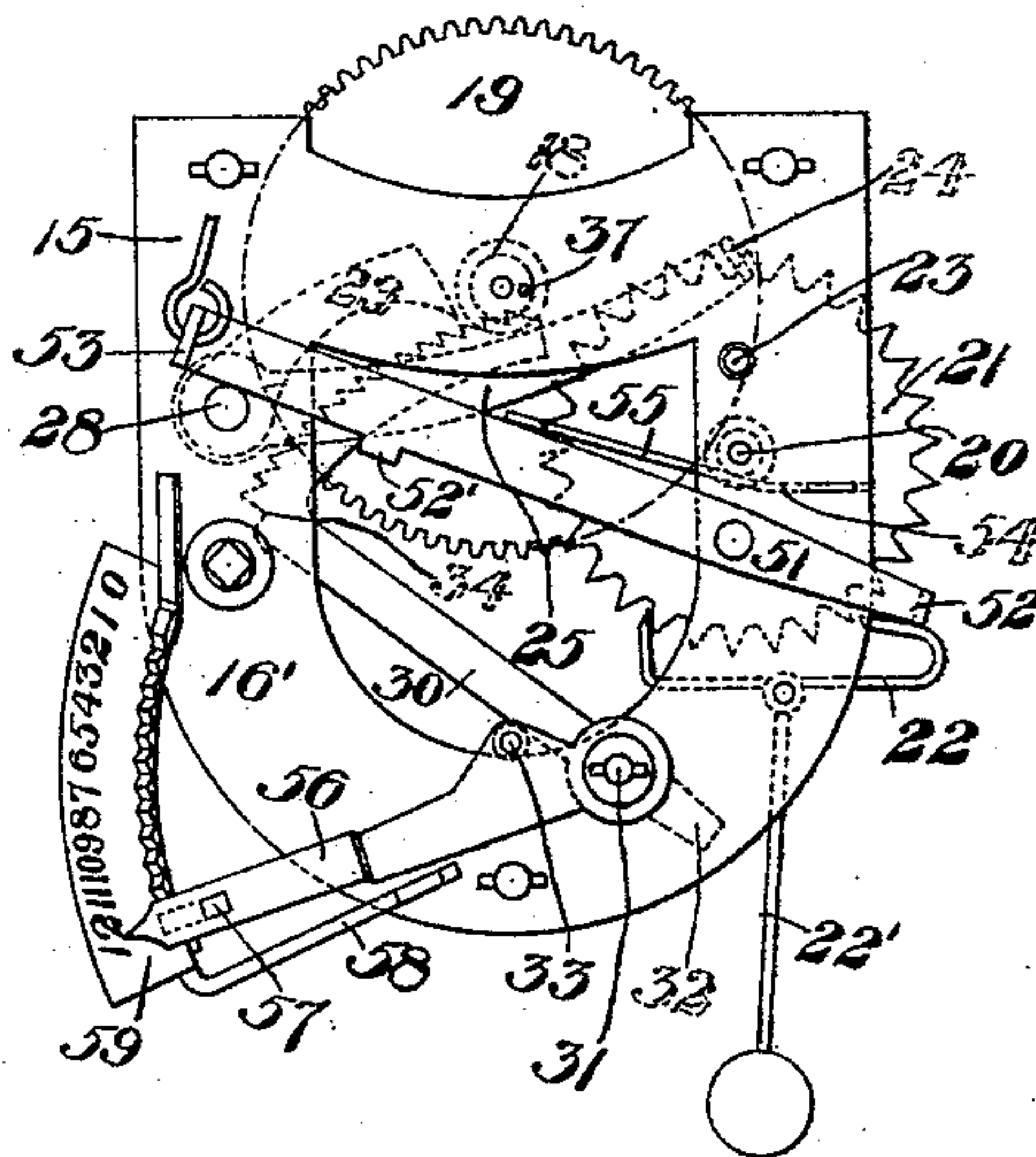


Fig. 8.

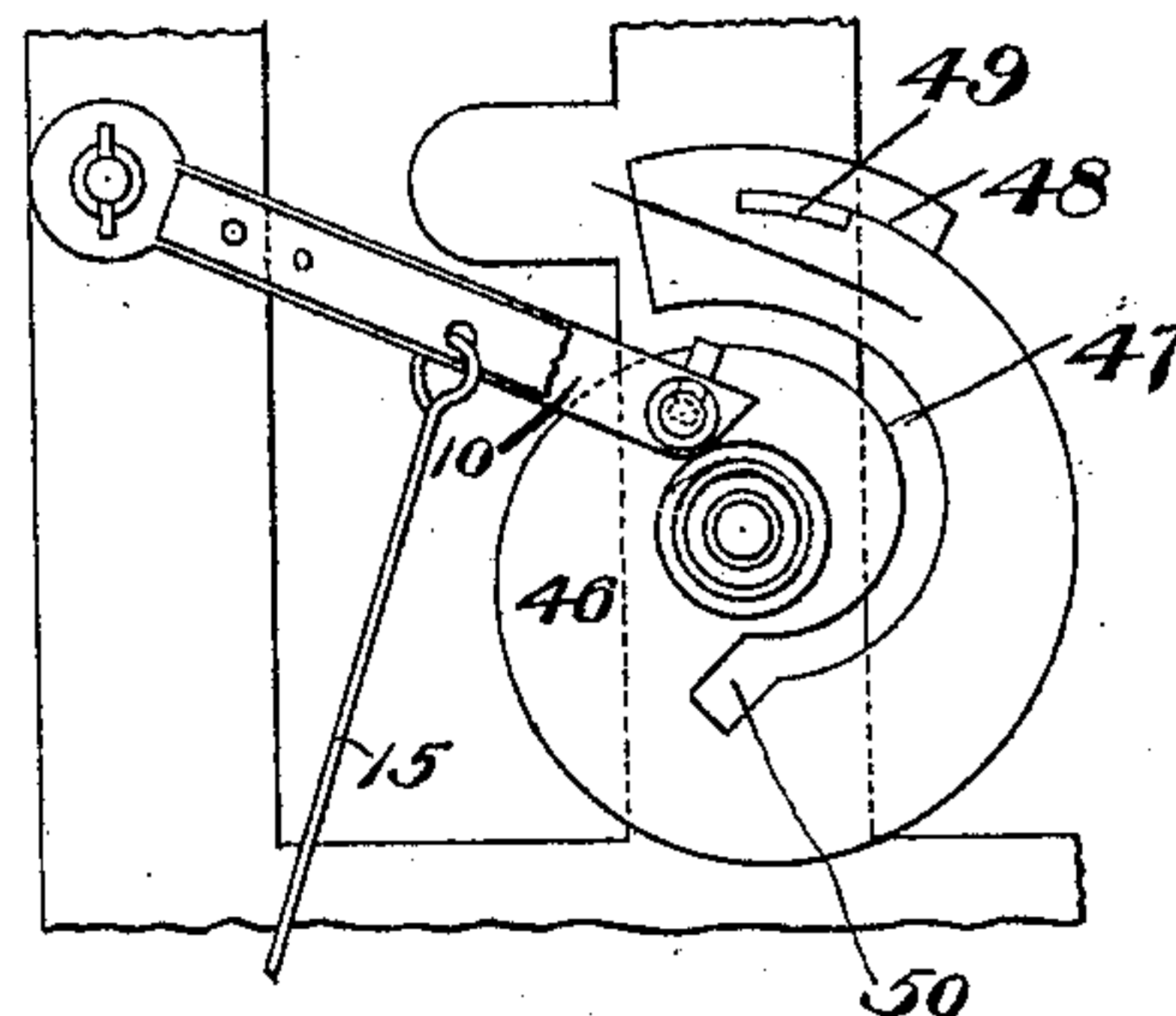


Fig. 14.

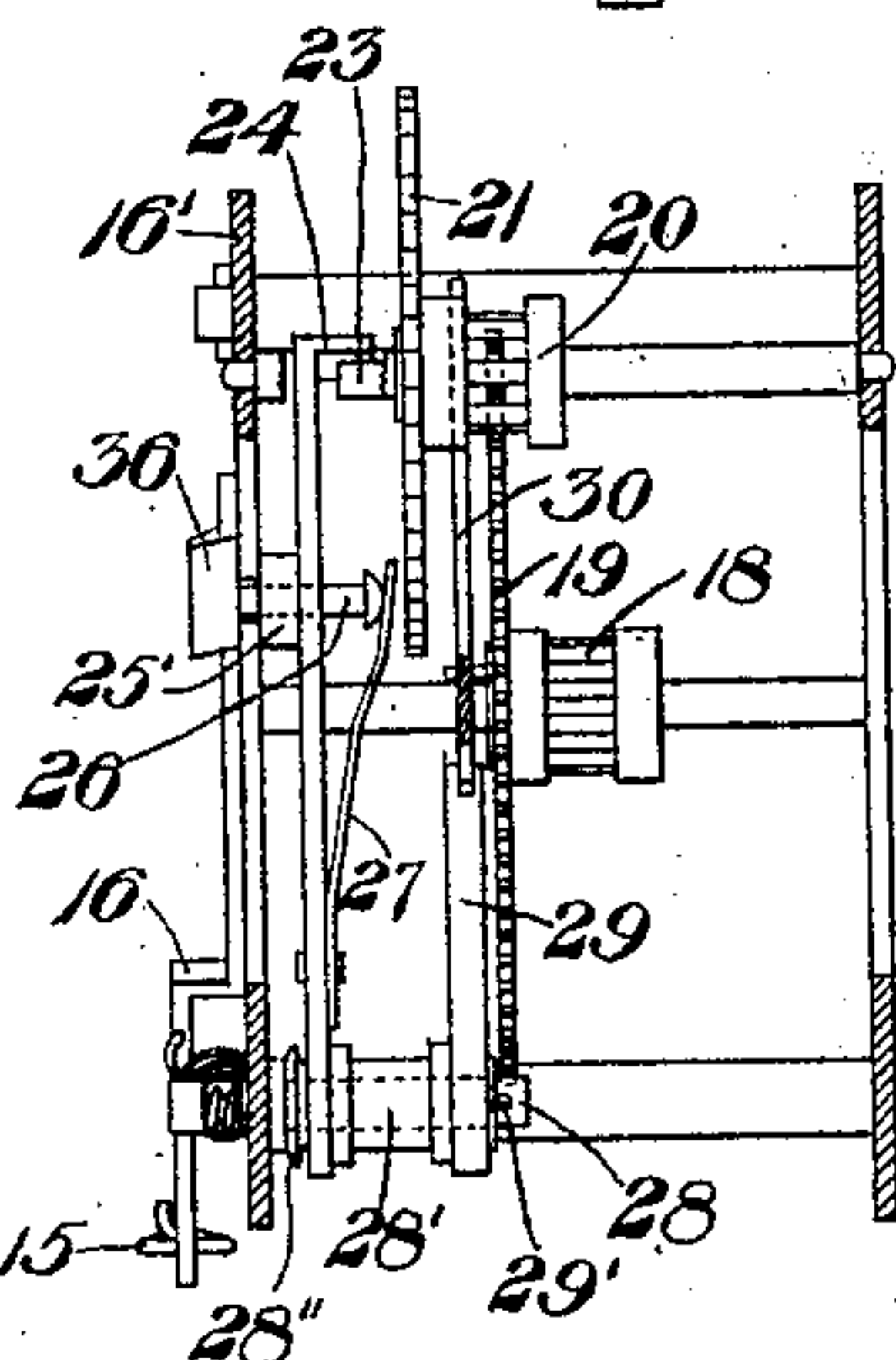


Fig. 11.

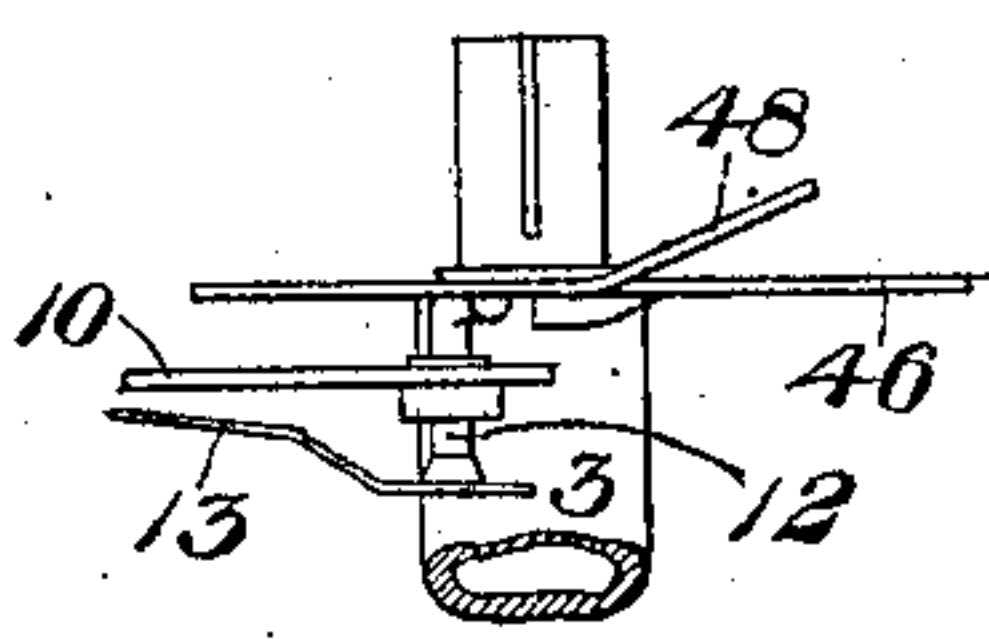
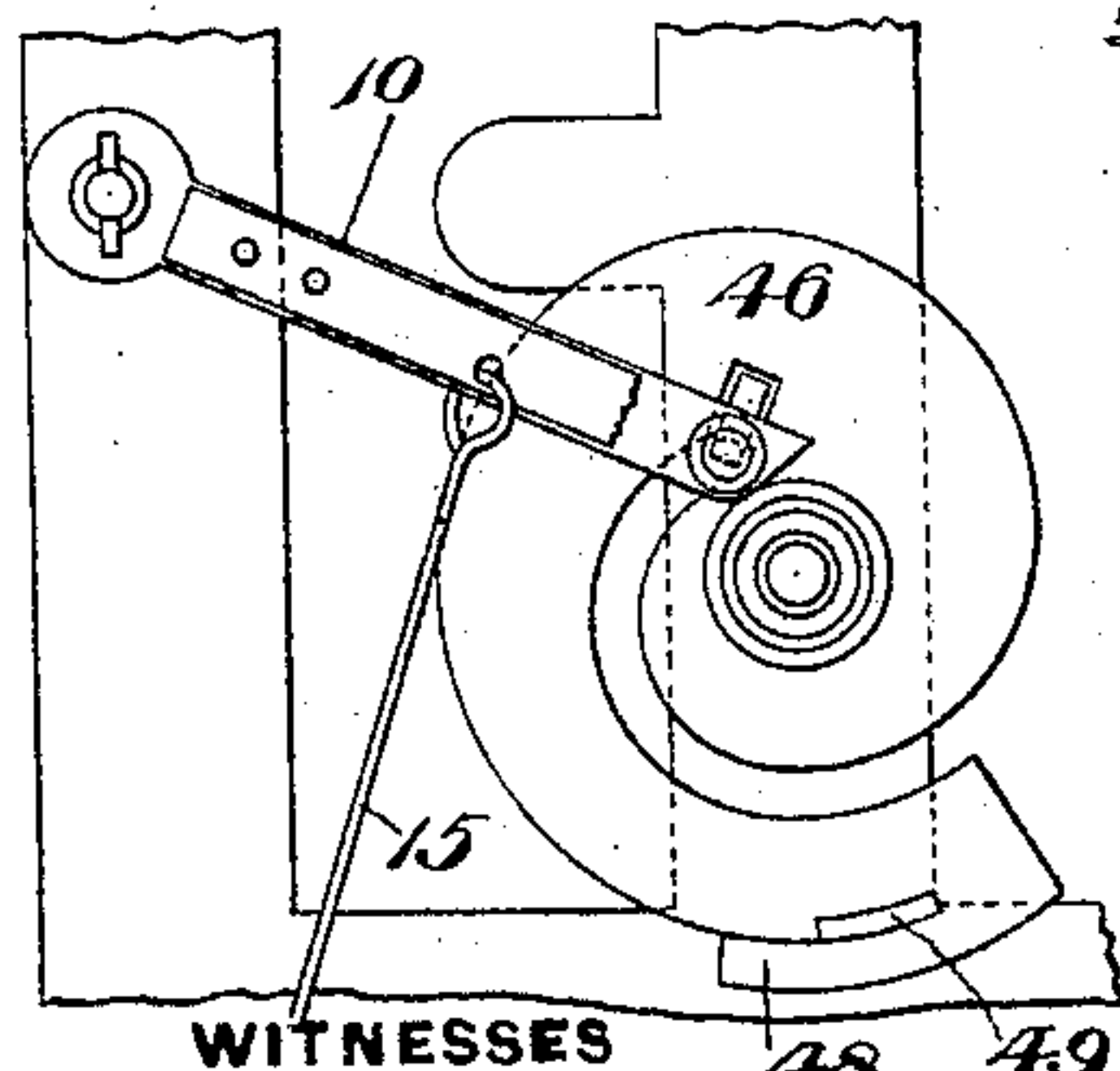


Fig. 10.



WITNESSES

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Fig. 12.

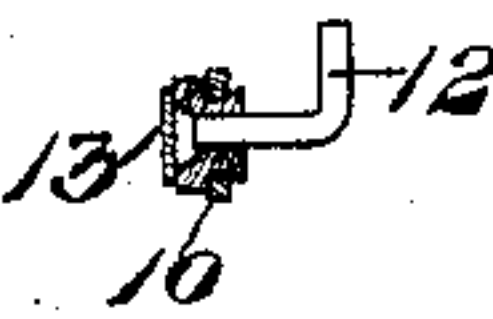
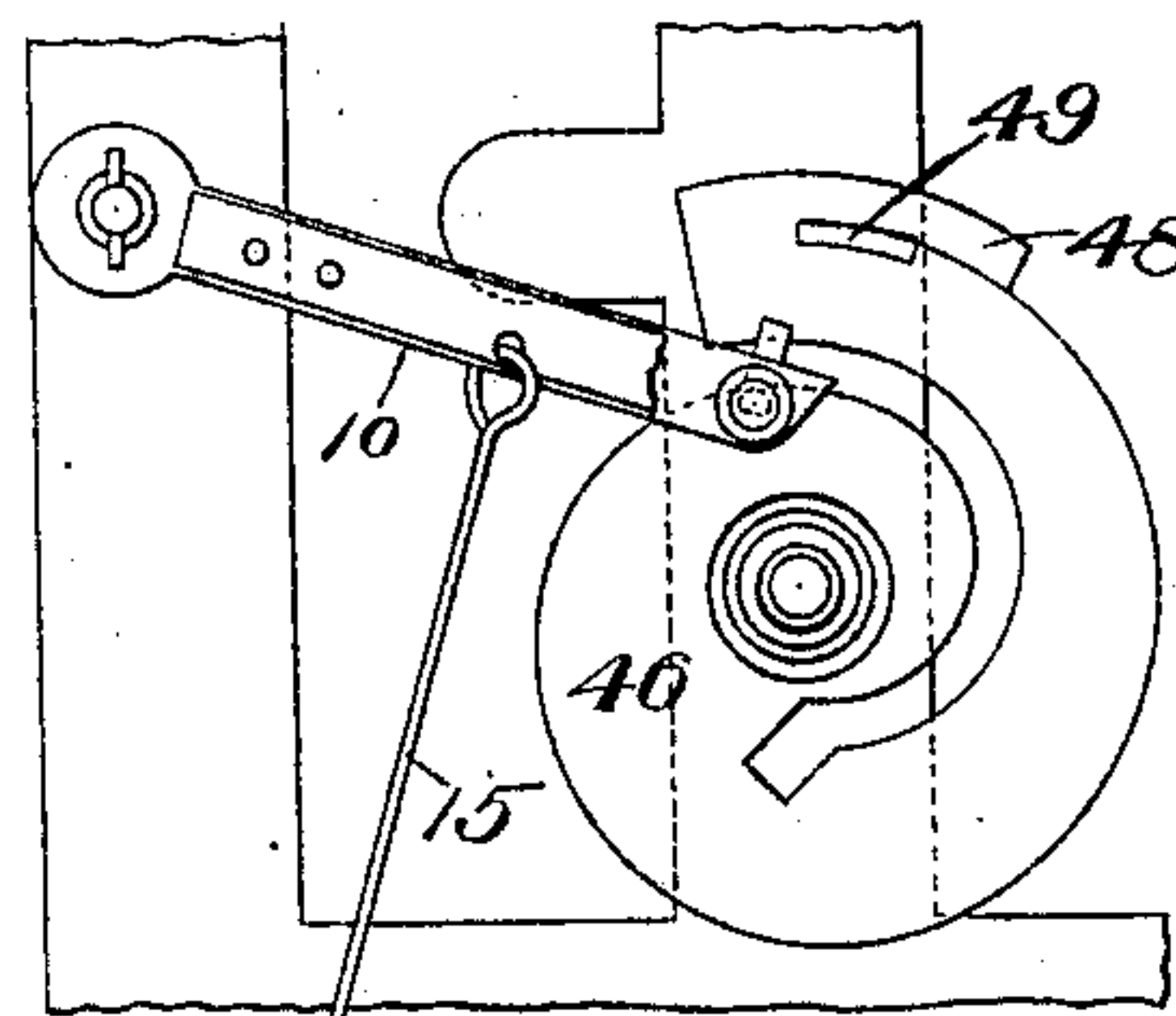


Fig. 9.



INVENTOR

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# UNITED STATES PATENT OFFICE.

FREDERICK D. HOEHL, OF PITTSBURG, PENNSYLVANIA.

## ALARM-CLOCK.

SPECIFICATION forming part of Letters Patent No. 606,143, dated June 21, 1898.

Application filed July 19, 1892. Serial No. 440,532. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK D. HOEHL, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Alarm-Clocks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

10 Figure 1 is a front view of the dial of a clock constructed in accordance with my invention. Fig. 2 is a front view of the alarm-controlling cam and the alarm-movement. Fig. 3 is a similar view of the alarm-movement shown  
15 in a different position. Fig. 4 is a detail view hereinafter referred to. Figs. 5, 6, and 7 are front, side, and top elevations, respectively, of the alarm-controlling cam. Figs. 8, 9, and  
20 10 are front elevations showing different positions of a modified form of the alarm-controlling cam. Figs. 11 and 12 are detail views thereof. Figs. 13 and 14 are side elevations, partly in section, of the alarm-movement of  
25 Figs. 2 and 3; and Fig. 15 is a front elevation of a modified form of the alarm-movement.

My invention relates to that class of alarm-clocks wherein the alarm may be set to sound once in twenty-four hours at any desired time; and it consists in an improved construction  
30 and arrangement of the parts whereby the works are much simplified and very little care is required in setting the alarm.

It also consists in mechanism which may be set or adjusted to regulate the duration of the  
35 alarm, all as hereinafter more fully described, and set forth in the claims.

In the drawings, in which similar numerals indicate like parts, 2 represents a disk secured to a sleeve 3, which fits tightly about the hour-hand spindle 3' and normally rotates therewith, but may be turned independently of the same. The front portion of this sleeve is sufficiently hollowed out to allow the usual tubular eye of the hour-hand to enter the same  
40 and prevent interference with said tubular eye when the sleeve 3 is turned and also to make said sleeve light. To the disk 2 is secured a spiral band 4, whose outer end portion 5 is somewhat broader than elsewhere. An  
45 inclined strip 6 is secured on this outer part 5 and forms a seat for a bridge 7, pivoted loosely thereto, and said seat is arranged so

that the front side of the bridge is level with the highest point of the strip 6 and with the band 4. The bridge 7 has a rearwardly-bent extension 8, to which is attached one end of a spiral spring 9, whose other end is attached to a pin 9', secured to the front side of the disk 2 and serves to draw said bridge into the position of Fig. 2. A lever 10 is pivoted loosely to the clock-movement plate 11, and said lever is provided at its outer end with a perforation, within which is provided a tongue 12, which is normally held inwardly by a flat spring 13, secured to the lever by pins 14, and is engaged by the spiral band 4. From this lever extends the rod 15, which connects the same with the lever 16, pivoted loosely to the front alarm-movement plate 16'. In this alarm-movement the toothed wheel 17 is driven, primarily, by the usual spring and meshes with a pinion 18, whose shaft carries a toothed wheel 19, meshing with a pinion 20 upon the shaft of the escape-wheel 21. The pallet 22 is fixed to the spindle which carries the bell-clapper lever 22', and upon the escape-wheel is secured a projecting pin 23, which is normally engaged by a projecting tongue 24 upon the end of a lever 25. This lever 25 is provided with a bearing 25', which is secured to said lever, and has a perforation which is flattened upon one side and supports a tongue 26 of similar shape as said perforation and which is arranged to project in the path of a lever-hook 36 and is held in said projected position by a spring 27, secured to the rear side of the lever 25. A slot is provided in the front plate 16' in the path of said tongue for a purpose hereinafter referred to. The bearing of the tongue 26 is secured to its lever so that the round side of the perforation is toward the lever-hook 36 when in normal position, and thus the tongue is always held in the same relative position. The front end of said tongue is beveled off so that the flat side is the longest, and the hook 36 is bent upward, as shown in Fig. 13, in order that said hook may easily force the tongue and the spring 27 rearward and thus pass the tongue.

28 is a pin, upon the rear portion of which is arranged a sleeve 28', to which its lever 25 is secured and also another lever or pawl 29. A washer 28'' is placed between said sleeve



and a shoulder of the pin 28, while a rivet 29' passes through said projection in front of the sleeve and, pressing the same tightly against the washer, frictionally tightens the sleeve to the projection, but it is arranged loosely enough so that the gravity of the attached parts slightly exceeds the friction, and the lever 25 and its attached bearing 25' are also arranged so that the front side of said bearing slightly touches the rear side of the front plate 16', and thus the motion of these parts is retarded for the purpose hereinafter referred to.

30 is a lever arranged loosely upon a pin 31, extending rearwardly from the front plate 16', and about the pin is a spiral spring 31', one of whose ends is attached to said lever and the other to the front plate 16' in order to draw said lever downwardly until its projecting end 32 comes opposite the pin 33, which is secured to said front plate. This lever 30 is provided at its upper end with a certain number of teeth and with an offset 34, both of which are engaged by a pin 37 and by the pawl 29. The pin is secured to the wheel 19 and rotates at an equal rate therewith, engaging the teeth of the lever when revolving, and the pawl keeps the teeth of said lever in line with the pin 37 while the same is revolving and engages the offset to lock with the cooperating lever 25 the alarm-movement. The pin 33 is arranged in a certain portion of the arc of the projecting lever end 32 to correspond to a certain number of teeth of the lever 30 which may be desired to be operated by the pin 37. It will be seen in Figs. 2 and 3 that this pin 33 is arranged so that ten teeth of the lever are operated by the pin 37, and the highest number which may be operated in the form shown is twelve; but this lever may be arranged to have many more teeth if it should be desired.

35 is a spiral spring, of which one end is attached to the pin 28 and the other to the inner portion of the lever 16, which is connected with the rod 15 to draw the connected parts to their normal position, as in Fig. 2. A hand-lever, having arms 38 and 38', is pivoted to the front movement-plate, so that it will stay in any position it may be moved, and the ends of said arms are bent rearwardly to respectively engage the pallet and the protruding lever end 32. A slot is arranged upon said front plate opposite said lever end 32 and the end of the arm 38', permitting the arm 38' to enter for the purpose of stopping off the alarm entirely when desired.

The operation of the device is as follows: When the disk rotates in the direction of the arrow, the spiral cam 4 engages the tongue 12 of the lever 10 and gradually lifts said lever, thereby drawing upon the end of the lever 16 through the rod 15. When the cam completes one revolution, the tongue 12 strikes against the bridge and gradually forces the same back until it has passed, when the spring 9 retracts the bridge, the tongue riding upon the outer

coil of the cam and continuously drawing upwardly on the lever 16. As this lever 16 is raised the hooked end 36 is forced downwardly and passes over the beveled end of the tongue 26, forcing the same back against the action of the spring 27 until the lever is past, when the tongue is forced back to place, and the hook is consequently behind the flat or top edge of the bevel and cannot pass over the same in its return motion. When the cam has nearly completed its two revolutions, so that the tongue 12 reaches the incline 6, it rides up this incline and is forced forwardly against the spring 13 until the end of the raised part 5 of the cam-strip is reached, when it is released and slides downwardly over the bridge and middle coil into the position of Fig. 2, the tongue being then forced into normal position by the spring. As the tongue 12 is released by the cam the spring 35 will draw the lever 16 downwardly, and thereby force its hooked end against the tongue 26 and raise the levers 25 and 29, the lever or pawl 29 moving out of the offset in the toothed lever, allowing the lever to drop to a position where it is arrested by the pin 33, the tongue 24 of the lever 25 at the same time being moved out of the path of the pin 23. After the end 36 of the lever 16 has passed the tongue 26 the levers 25 and 29 are allowed to drop back; but as the toothed lever 30 has dropped a certain amount the lever or pawl 29 cannot drop into the set-off of the toothed lever, and hence falls upon the ratchet-teeth, keeping the tongue 24 still out of the path of the pin 23. The alarm mechanism is now free and the alarm sounds. As the wheel 19 revolves and the pin 37, revolving at the same speed therewith, engages the teeth of the lever 30 it moves one tooth of the same at every revolution, and as the pawl or lever 29 rests upon the same it causes the pawl to slide from one tooth to another and preserve the toothed lever in the position left by the pin 37; but when the set-off is engaged by the pawl the lever 25 drops downwardly and brings its tongue 24 into the path of the pin 23, thereby locking the alarm-movement. When the hand-lever 38 is turned to lock the alarm, one arm enters the slot in the frame and engages the toothed lever 30, while the other arm engages the escapement-lever, and in this position the lever 16 will override the tongue 26 and move the lever 25 without sounding the alarm.

In Fig. 1, which illustrates the dial I prefer to employ, 39 is the dial, having the usual numbers thereon. 40 and 41 are the hands, and 42 an ordinary alarm-dial secured to the sleeve 3 of the cam, as ordinarily. 43 is a rigid pin secured to the back of the alarm-dial and arranged to engage a rotary sign-dial 44, pivoted upon the rear side of the time-dial 39. The sign-dial is provided around its periphery with a series of alternating signs indicating the first and second cycles of the cam—such as the letters "A" and "W," which appear



through a slot in the time-dial—and with a series of notches which are successively engaged by a spring 45, which holds the dial in any position to which it is turned.

5 In Fig. 2 the cam is shown as having just released the lever 10 and the alarm having been consequently sounded. In Fig. 1 this is indicated by the letter "A," disclosed through a slot in the dial, thus showing that the cam  
10 begins its first cycle and that if the alarm is set for a certain hour while the letter "A" is in view the alarm will be sounded at that hour in the second cycle from the time indicated by the clock. The letter "A" indicates "After,"  
15 the cycle after twelve hours from the time indicated by the clock when setting the alarm. If the alarm-dial is rotated once, the next sign, the letter "W," appears in the slot, and the alarm will now sound at any particular  
20 hour in the second cycle.

In Fig. 1 the hands indicate the hour of 3.30 p. m., and if an alarm is desired, say at six a. m., the alarm-setting dial is turned forward until the division "6" comes opposite the hour-  
25 hand 41, which is the pointer for the alarm-dial, as in an ordinary alarm-clock. Thus the alarm-controlling mechanism was turned nine and one-half divisions, and consequently has fourteen and one-half divisions yet to rotate,  
30 this being equal to the passage of the hour-hand from 3.30 p. m. to 6 a. m. If the time is the same and the alarm is desired at six p. m., the alarm-dial is turned once around, thus bringing the letter "W" into view, and then  
35 turned again until the division "6" is opposite the hour-hand, the alarm-dial being thus turned twenty-one and one-half divisions, and consequently two and one-half divisions yet remain, this being equal to the passage of the  
40 hour-hand from 3.30 to 6 p. m.

In Figs. 8, 9, and 10 I illustrate a modified form of alarm-controlling cam, consisting of a disk 46, having a curved slot 47, an inclined outer portion 48, and a curved projection 49.  
45 The lever 10, carrying the rod 15, is provided with the tongue and spring, as before. The tongue, however, is flattened on one side to preserve it in the same relative position and is provided at its inner end with an extension  
50 bent at right angles to the same, as in Fig. 12, to prevent the tongue from slipping into the curved slot when released by the projection 49, this extension taking the place of the swinging bridge in the other construction.  
55 A straight tongue and bridge may, however, be used with this form of cam, if desired, the tongue sliding upon the disk 46 until it reaches the straight end 50 of the slot, when it drops thereinto. The incline 48 raises the tongue  
60 to the top of the disk, so that it again takes the position shown.

In the modified form of alarm-movement shown in Fig. 15 the lever 16, spring 35, the front extending portion of the pin 28, and the  
65 tongue 26 and its bearing and spring are omitted, and the sleeve 28', which carries the pawl 29 and lever 25, is arranged loosely upon

the projection 28, while the pin 31 is arranged so that it extends from the front side of the movement-plate. 51 is a lever pivoted loosely  
70 to the movement-plate and having two rearwardly-bent tongues 52 and 52', which engage, respectively, the pallet and the lever 25, and having a forwardly-bent tongue 53, which is connected with the rod 15. A spring 54 is  
75 secured to the rear side of the front plate and has a forwardly-extending tongue 55, which presses against the lever 51 and is thereby forced upwardly when the same is raised by the action of the cam. When said lever is  
80 gradually raised, its tongues 52 and 52' are moved toward the pallet and lever 25, respectively, and at the moment the lever-tongue 24 is moved out of the path of the pin 23 the escapement is sufficiently locked by the  
85 tongue 52 to prevent the sounding of the alarm, and after the lever 30 is raised to its full extent the parts assume the position shown, the pawl 29 being then out of the path of the lever 30 and said lever having dropped  
90 to its proper position. At the moment the lever 51 is released by the cam it is forced downwardly by the spring 54, and thereby the tongues 52 and 52' are sufficiently removed out of the path of their respective parts to  
95 allow the same to operate, as explained in the other form. A lever 56 is loosely arranged upon the front portion of the pin 31 and is provided on its rear side, at its outer end, with a strip 57, which is arranged to engage with a  
100 series of notches arranged upon a strip 58, which is secured to the movement-plate and to which is secured an index-plate 59 to indicate the position of said lever 56. The pin 33, which is shown in the other form secured  
105 to the front plate 16', is secured to the lever 56, as shown, and is arranged to move in the path of the lever 30, and its relative parts are so constructed and arranged that if the lever  
110 56 is set in a certain notch of the strip numbered from "1" to "12" said pin will be in the position in the arc of the lever 30 which is equivalent to the respective number of the notch in which the lever 56 has been set and the number of teeth which the lever 30 may  
115 bring within the path of the pin 37. It is obvious that in whichever notch the lever 56 is set the number opposite the same indicates the respective number of teeth which the lever 30 may bring within the path of the pin  
120 37 in said position, and consequently the number of revolutions of the said pin 37 and wheel 19, before the alarm is stopped, and as the pin 33 is thus made adjustable the duration of the alarm may be lengthened or  
125 shortened thereby, as desired. If no alarm is desired, the lever 56 may be set in the notch-mark "0," which keeps the lever 30 in a raised position and permits the pawl 29 and lever 25 to drop back to normal position each  
130 time they are raised by the action of the cam, and consequently the alarm is not sounded.

Many other changes in the form and arrangement of the parts will readily suggest



themselves to those skilled in the art without departing from my invention.

The advantages of my construction are obvious. A cam may be mounted directly upon the hour-hand spindle and the ordinary alarm-dial employed and the alarm thus set for any time in twenty-four hours as easily as with an ordinary alarm-clock, while the mechanism may also be set or adjusted to regulate the duration of the alarm.

I claim—

1. In a clock, the combination with the clock-movement, of an alarm-movement, an alarm-controlling cam rotated by the clock-movement more than once in a certain period of time and arranged to actuate the alarm-movement once in the same period, an alarm-setting plate having divisions, and an indicator operated by the alarm-setting plate and arranged to indicate continuously the position of the alarm-controlling cam; substantially as described.

2. In a clock, the combination of the clock-movement arranged to complete one cycle of motion in twelve hours, an alarm-movement, an alarm-controlling cam rotated by the clock-movement twice in twenty-four hours and arranged to actuate the alarm but once in the same time, an alarm-setting dial having twelve divisions, and a movable sign operated by the alarm-setting dial arranged to indicate continuously the position of the alarm-controlling cam; substantially as described.

3. In a clock, the combination with the clock-movement, of an alarm-movement, an alarm-controlling mechanism arranged to be rotated by the clock-movement more than once in a certain period of time and to actuate the alarm but once in the same time, said mechanism consisting of a flat spiral cam of more than one convolution, the path of the convolutions receding from the center of the spiral, an element coöperating with the cam, one of said parts being arranged to actuate the other, and an alarm-setting dial having divisions; substantially as described.

4. In a clock, the combination with the clock-movement, of an alarm-movement, mechanism operated by the clock-movement for controlling the alarm-movement, stop mechanism for the alarm, means connected with the alarm-controlling mechanism for operating the stop mechanism, a pivoted lever which may be adjusted to alter the duration of the alarm, and mechanism for retaining said lever in its adjusted position; substantially as described.

5. In a clock, the combination with the clock-movement, of an alarm-movement, means for controlling the same, stop mechanism for the alarm, mechanism which may be adjusted to alter the duration of the alarm, means for retaining said adjusting mechanism in its adjusted position, means operated

by the clock-movement to disengage the stop mechanism, and mechanism for automatically returning the stop mechanism to its locking position; substantially as described.

6. In a clock, the combination with the clock-movement, of an alarm-movement, a flat spiral cam of more than one convolution the path of the convolutions receding from the center of the spiral, mechanism in engagement with said cam for operating the alarm-movement, and mechanism near the outer terminus of the cam by which the mechanism in engagement with the cam is brought to a position to be returned to its starting-point at the center of the cam; substantially as described.

7. In a clock, the combination with the clock-movement, of an alarm-movement, a pivoted lever for starting and stopping the alarm, means operated by the clock-movement to disengage said lever for the purpose of sounding the alarm, and a toothed lever by which said pivoted lever is returned to its alarm-stopping position; substantially as described.

8. In a clock, the combination of an alarm-movement, means for controlling the same, stop mechanism for the alarm, a pivoted adjusting-lever for altering the duration of the alarm, and an indicator for indicating the different durations of the alarm; substantially as described.

9. In a clock, the combination with the clock-movement, of an alarm-movement, a cam, a lever adapted to engage with said cam for operating the alarm-movement, and a bridge-piece for returning the lever to its starting position after it has reached the outer terminus of the cam; substantially as described.

10. In a clock, the combination with the clock-movement, of an alarm-movement, a cam, a lever having in its end a spring-actuated pin or stud adapted to engage with said cam for operating the alarm-movement, and mechanism on the cam near its outer terminus for engaging and retracting the pin; substantially as described.

11. In a clock, the combination with the clock-movement, of an alarm-movement, a cam, a lever having in its end a spring-actuated pin or stud adapted to engage with said cam for operating the alarm-movement, and a bridge-piece for returning the lever to its starting position after it has reached the outer terminus of the cam; substantially as described.

In testimony whereof I have hereunto set my hand this 17th day of June, A. D. 1892.

FREDERICK D. HOEHL.

Witnesses:

W. B. CORWIN,  
H. M. CORWIN.