

A. KAISERMAN.

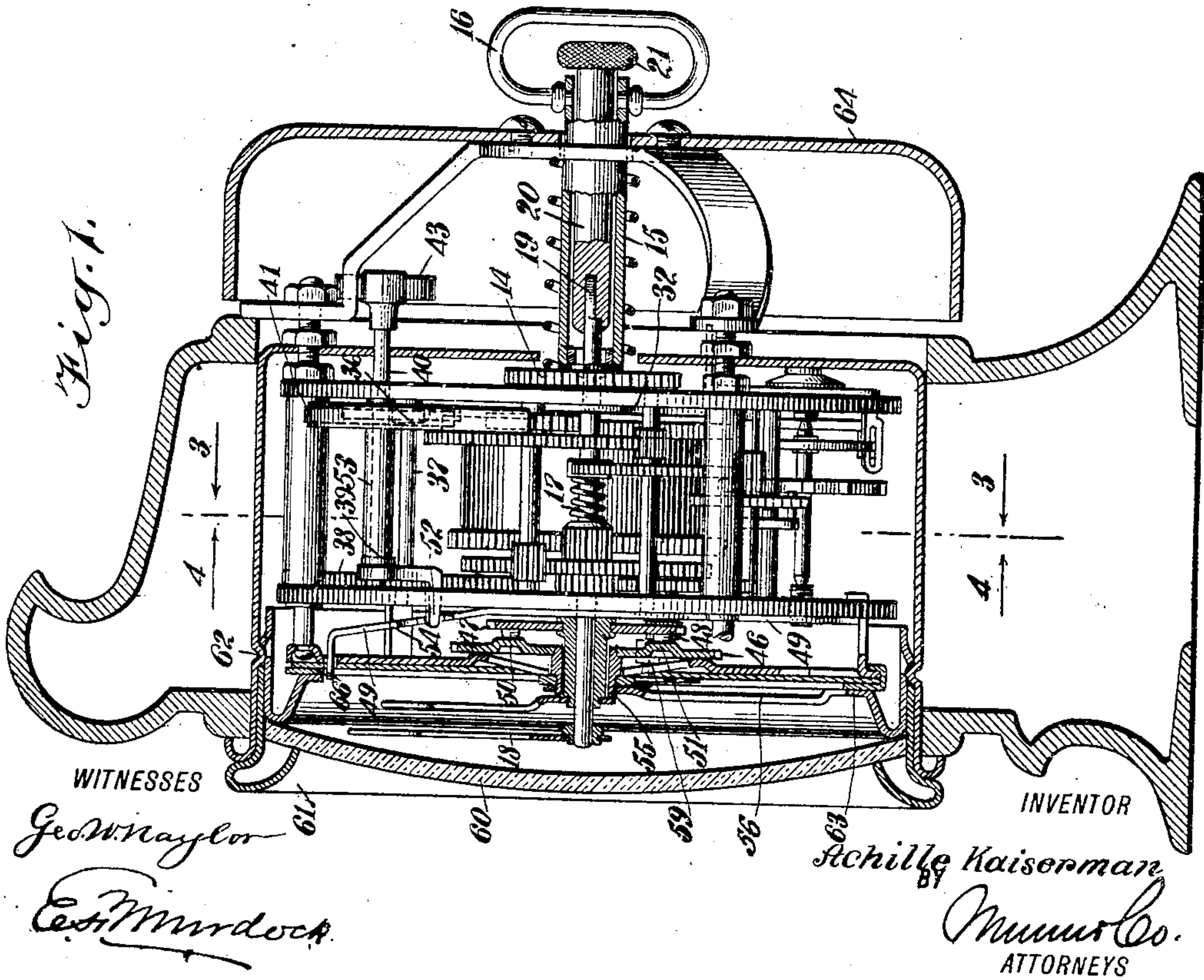
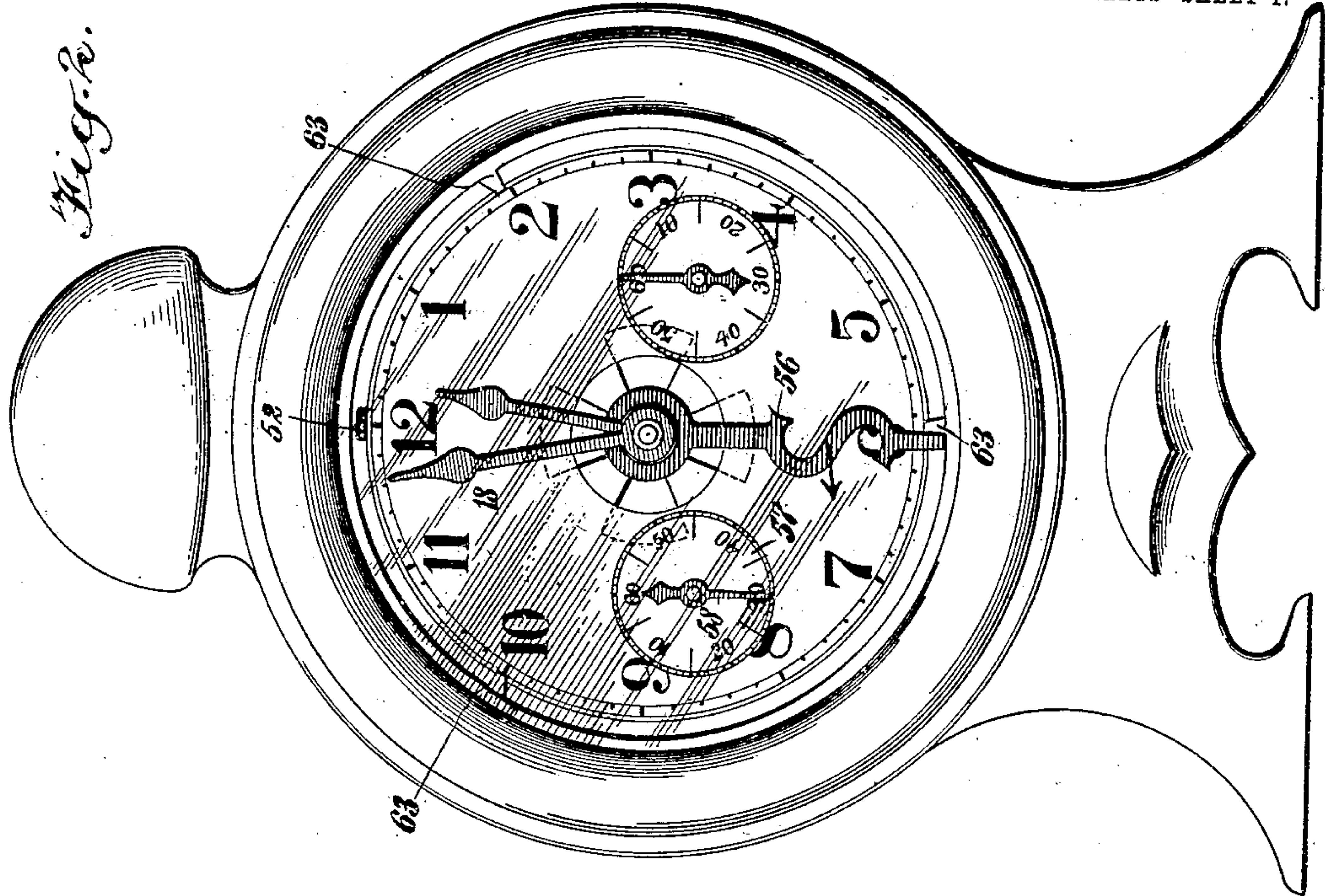
ALARM CLOCK.

APPLICATION FILED JULY 15, 1909.

Patented July 12, 1910.

3 SHEETS—SHEET 1.

964,271.





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3 SHEETS—SHEET 2.

Fig. 4.

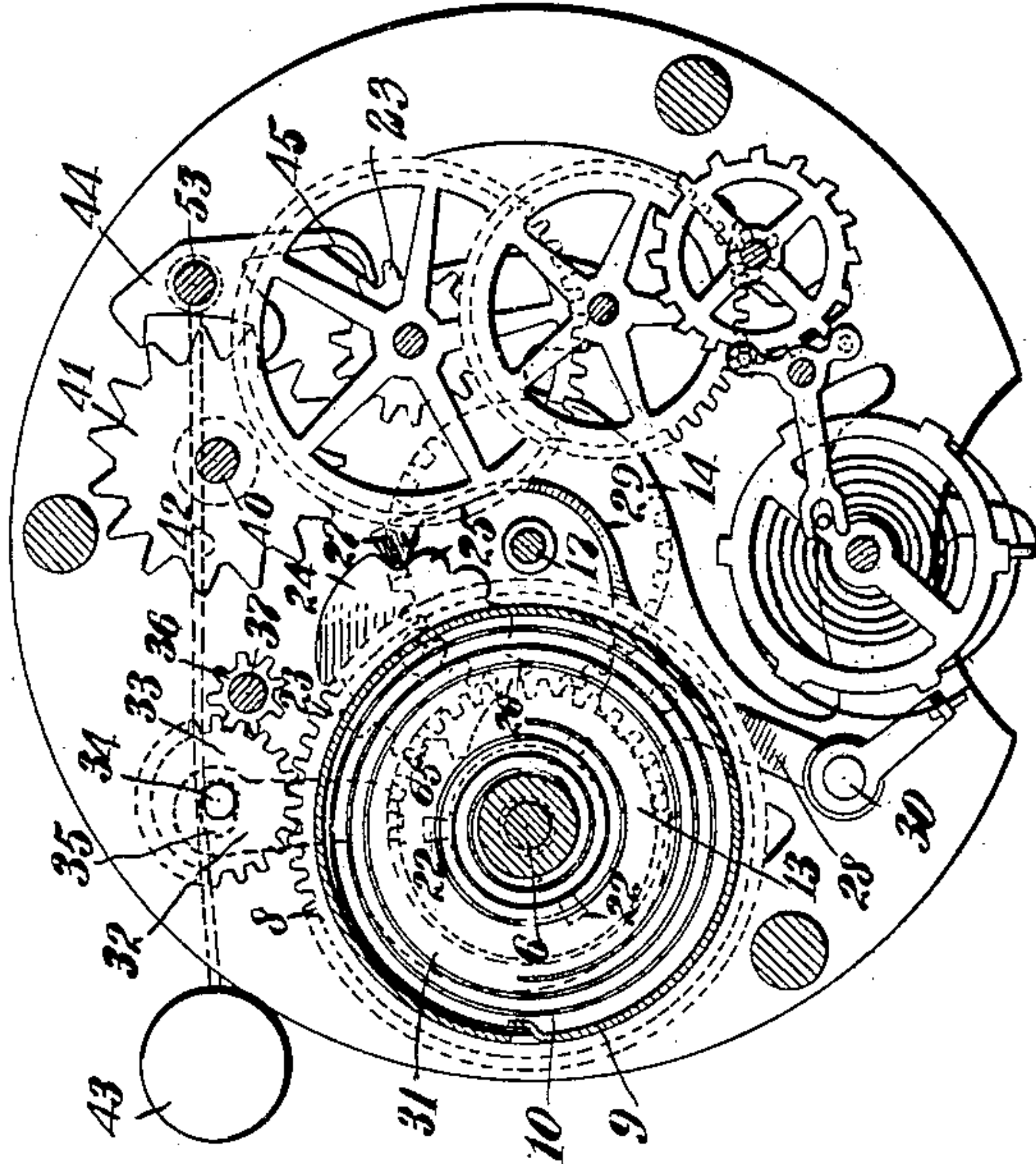


Fig. 3.

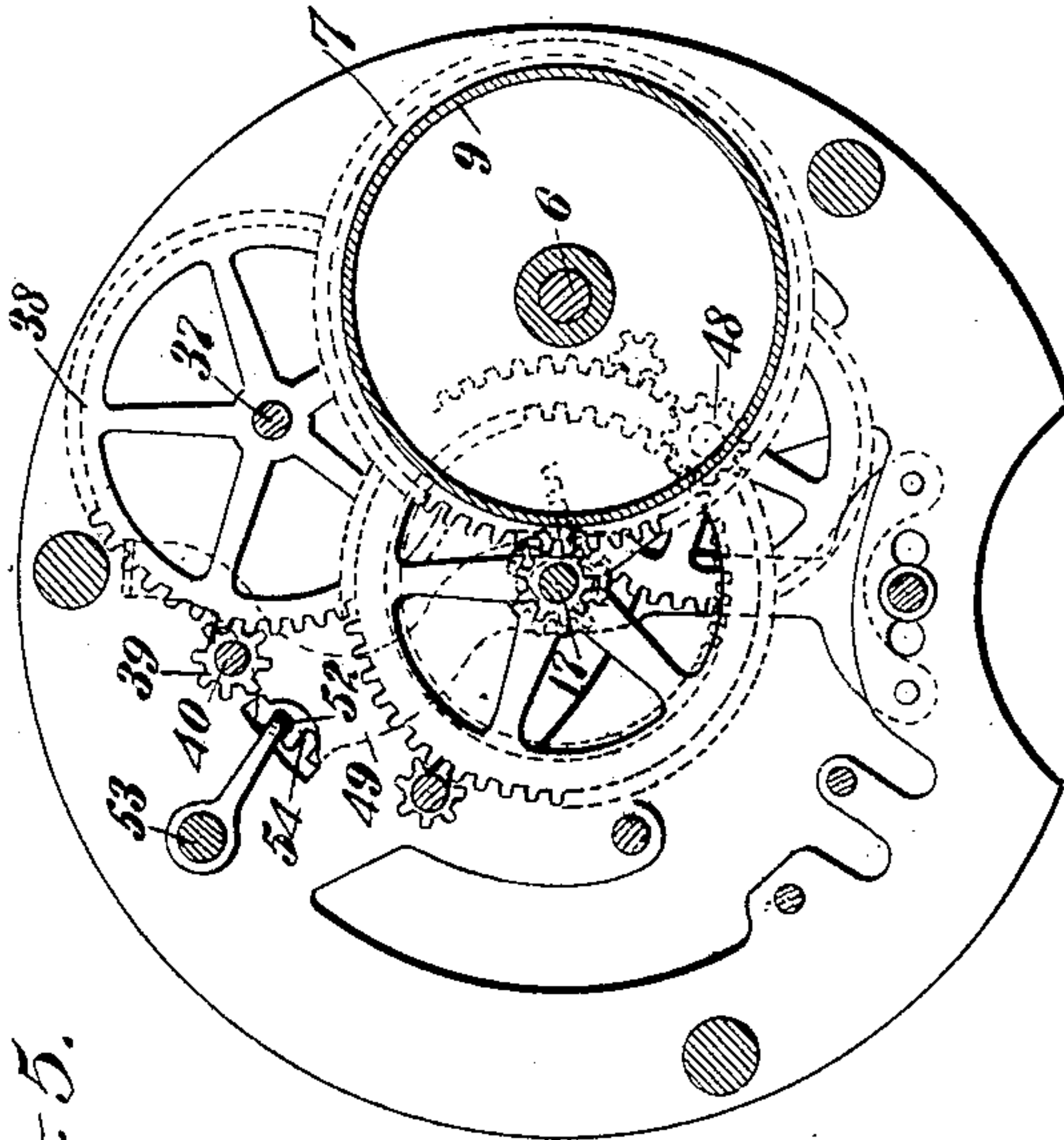
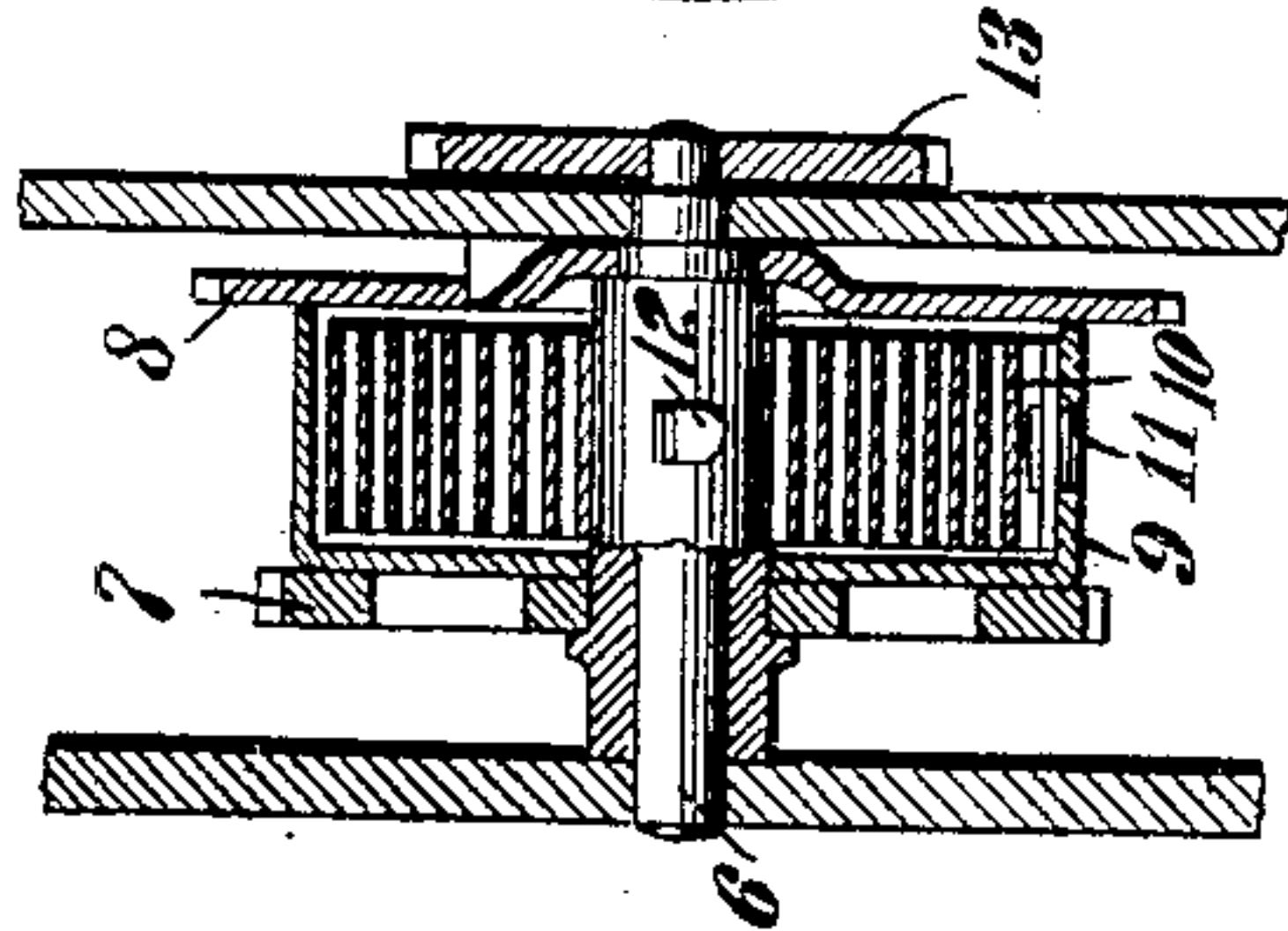


Fig. 5.



WITNESSES

Geo. W. Taylor  
C. H. M. Mack

INVENTOR

Achille Kaiserman

BY

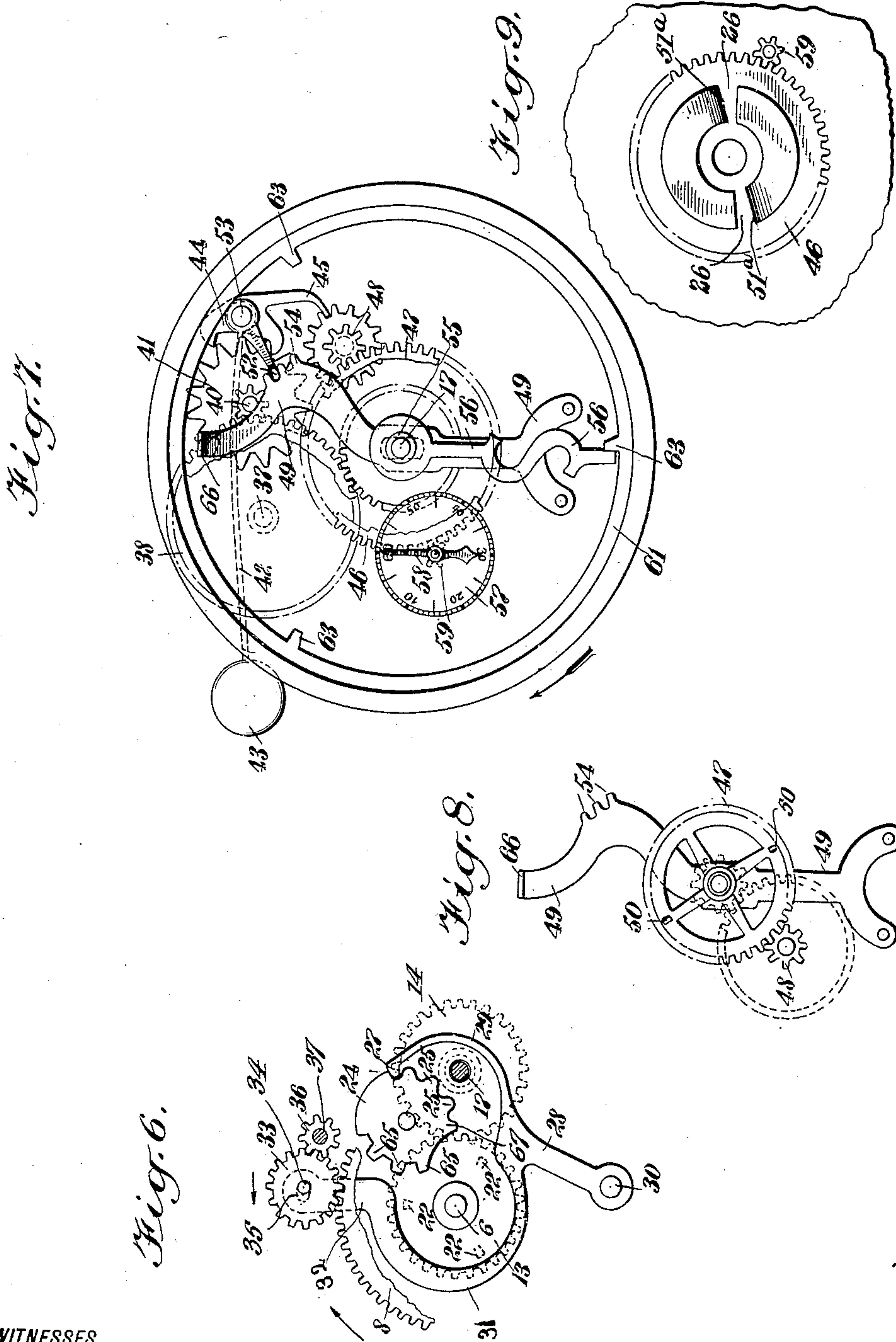
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ATTORNEYS

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3 SHEETS—SHEET 3.



WITNESSES  
*Geo. Maylor*  
*Ed. Mudock*

INVENTOR  
*Achille Kaiserman*  
BY *Wm. H. [Signature]*  
ATTORNEYS



# UNITED STATES PATENT OFFICE.

ACHILLE KAISERMAN, OF KANKAKEE, ILLINOIS.

## ALARM-CLOCK.

964,271.

Specification of Letters Patent. Patented July 12, 1910.

Application filed July 15, 1909. Serial No. 507,713.

*To all whom it may concern:*

Be it known that I, ACHILLE KAISERMAN, a citizen of the United States, and a resident of Kankakee, in the county of Kankakee and State of Illinois, have invented a new and Improved Alarm-Clock, of which the following is a full, clear, and exact description.

Among the principal objects which the present invention has in view are: to provide a mechanism embodying a bell ringing alarm operatable by the time actuating mechanism of the clock; to provide a mechanism wherein the setting of the time for the alarm is operated simply and accurately to the minute; to provide a mechanism whereby the reversing of the alarm mechanism is prevented; to provide a mechanism whereby the operation of the alarm is prevented; to provide a structure for carrying the alarm bell on the frame of the clock; and to provide a combined time winding and time setting device within one and the same structure.

One embodiment of the present invention is disclosed in the structure illustrated in the accompanying drawings, in which like characters of reference denote corresponding parts in all the views, and in which—

Figure 1 is a vertical longitudinal section of a clock constructed in accordance with the present invention; Fig. 2 is a front elevation of a clock constructed in accordance with the present invention; Fig. 3 is a cross section taken on the line 3—3 in Fig. 1; Fig. 4 is a cross section taken on the line 4—4 in Fig. 1; and Fig. 5 is a longitudinal vertical section of the spring arbor and the power transmission wheel connected therewith; Fig. 6 is a detail view in diagrammatic arrangement of the alarm operating mechanism; Fig. 7 is a front view of the alarm setting and operating mechanism; Fig. 8 is a detail view showing the hammer-releasing device and the engaging wheel therefor; and Fig. 9 is a detail view of the time setting wheel and the alarm-releasing attachment connected therewith.

In the present invention, which pertains more particularly to the equipment of a clock with an alarm attachment, no alteration is made in the time mechanism. The gear 7 is fixedly attached to a spring barrel 9. The spring barrel 9 contains a spiral spring 10, to which it is connected by the end 11 of the said spring. The opposite

end of the spring 10 is anchored to an arbor 6, as shown at 12 in Fig. 5 of the drawings.

Fixedly mounted on the arbor 6 is a winding gear 13, which is held in toothed engagement with a gear 14 fixedly mounted upon a winding stem 15, upon which a winding handle 16 is mounted.

The stem 15 is loosely mounted about an arbor 17, carrying the minute hand of the clock. The arbor 17 is provided at the end opposite that carrying the hand 18 with a squared extension 19 to receive a time-setting key 20. The key 20 is provided with a knurled head 21 adapted to rest within the loop of the handle 16. The loop of the handle 16 normally rests over the head 21 of the key, and prevents the withdrawal of the same from engagement with the squared extension 19 of the arbor 17. By turning the handle 16 to one side the key 20 may be withdrawn from the stem 15.

When winding, the spring 10 exerts an expansion force upon the spring barrel 9 and upon the arbor 6. To the spring barrel 9 is fixedly attached the gear wheel 7, which is connected to the time operating mechanism of the clock. The gear wheel 8 is fixedly mounted upon the arbor 6.

In winding the spring 10, the stem 15 is rotated by the handle 16 rotating the gear wheels 13 and 14, thereby revolving the arbor 6 and winding the spring 10 thereon. The spring barrel 9 is held against moving, in answer to the pull of the spring, by the gear 7, and the time operating mechanism connected therewith. When, however, the alarm operating mechanism is released, the spring 10 is permitted to expand and rotate the gear 8. The spring 10 then drives the alarm operating mechanism. This action is controlled by the upturned extensions 22, 22, which are projected from the gear wheel 8 into the path of the teeth 65, 65 of the cam 24.

The cam 24 is formed of the shape substantially as shown in Figs. 4 and 6 of the drawings, having circular cams 25 and gear teeth 65, 65. It is the engagement by a head 27 of a lever 28 with the body of the cam 24 which arrests the winding action of the arbor 6 for the purpose of ringing the alarm. The lever 28 is provided with a spring section 29, at the end of which is located the head 27. The lever 28 is pivoted at 30 in the movement frame of the clock. The lever 28 has a circular section 31, which



extends around the arbor 6, and is provided with a straight extension 32, upon the end of which is mounted a small gear wheel 33. The gear wheel 33 is pivoted at 5 34 within a slot 35 formed in the end of the straight extension 32. The purpose of this mounting is that when the gear 8 is rotated in the direction impelled by the winding of the spring 10, the wheel 33, 10 which normally rests in toothed engagement with a small pinion 36, is carried out of engagement therewith by moving in the direction of the arrow shown in Fig. 6. When, however, the expansion of the spring is 15 exerted to rotate the gear 8 backward, the wheel 33 is moved toward and into engagement with the said wheel 36.

The wheel 36 is mounted on an arbor 37, upon the opposite end of which is fixedly 20 mounted a wheel 38. The wheel 38 is in toothed engagement with a small pinion 39, which is mounted upon a shaft 40, whereon is fixedly mounted a star wheel 41. The star wheel 41 is engaged and controlled by 25 an oscillator 44, the tail 45 whereof is operatively engaged by the time train gears 23, whereby the said oscillator, the hammer arm 42 and the hammer 43 are held as each tooth of the time controlled wheel passes 30 under the tail 45. As a rule it requires sixteen seconds for each of the said teeth to pass under the said tail 45. The intervals between the teeth may be arranged to suit. This construction and arrangement pro- 35 duce an intermittent ring of the alarm.

The expansion of the spring 10, operating upon the spring barrel 9 when the gear 8 is held stationary, transmits the power of the said spring to the train of gears constituting the time mechanism, which forms no 40 part of the present invention except in so far that the time setting device for the alarm is controlled thereby. This control is effected by means of wheels 46 and 47. The 45 wheel 47 is in toothed engagement with a small pinion 48 constituting one of the train of gears forming the time mechanism for operating the alarm. The wheel 47 is slidably mounted upon the arbor 17, and is 50 forced outward thereon by a leaf spring 49. In the upper side of the wheel 47 are provided teeth 50, 50 which ride upon the under surface of the wheel 46. The wheel 46 has 55 formed on the under side a raised crown 51, in which is formed indentations 26, 26 to receive the teeth 50 when alined therewith. The teeth 50 ride out of the indentations 26 by inclined surfaces 51<sup>a</sup> provided therein, and fall into the same perpendicularly. 60 The wheel 47 is operated in time relation with the arbor carrying the hour hand of the clock.

When the teeth 50, 50 over-ride and fall into the slots provided therefor, the leaf 65 spring 49 is permitted to throw outward, re-

leasing the upturned lip 52, fixedly mounted upon and controlling the operation of the arbor 53 upon which the oscillator 44 is mounted. The leaf spring 49 is provided 70 with fingers 54, which are adapted to extend over and surround the lip 52. When the lip 52 is thus engaged it will be observed that the arbor 53 cannot oscillate, thus imprisoning and holding rigid the wheel 41, 75 and with it the arbor 40 and train of gears connected therewith back to the main spring 10.

By setting the wheel 46 with reference to the time dial, the slots into which the teeth 50 are inserted by the spring 49, is arranged. 80 The wheel 46 is mounted upon a short shaft 55, at the outer end whereof is carried an index hand 56. The index hand 56 bears a fixed relation with the slots formed in the wheel 46, hence by moving the hand 56 to 85 any fixed position upon the dial, the wheel 46 is compelled to assume a certain position relative to the wheel 47.

It is to regulate the position of the hand more accurately upon the dial that there is 90 provided a smaller dial 57, imprinted upon the main dial, and wherein is mounted a small index hand 58. The index hand 58 is rigidly connected with a small pinion 59, 95 which is held in toothed engagement with the wheel 46. The arrangement between the wheel 46 and the pinion 59 is such that the hand 56 bears the relation to the hand 58 that the hour hand of the clock bears 100 to the minute hand thereof. Hence, as the hand 56 is moved on the main dial of the clock, the hand 58 is moved by this smaller dial at a rate twelve 105 times faster. That is to say, for each minute division that the hour hand is moved on the dial the smaller hand 58 is moved twelve of its subdivisions, which indicate the sixty minutes of the hour. By this arrangement the operator can bring the hour hand to a 110 position on the main dial so that the alarm may be set for such a time as nineteen minutes past the hour, with the certainty of having the alarm operate on that division of time.

The hand 56 is shifted by means of the 115 rotary frame 61 of the crystal 60 of the clock. The rotary frame 61, wherein the crystal 60 is held, is held in the casing of the clock by the ridge formed by spinning inward the metal of the casing at 62. The 120 frame is provided with a series of dogs 63, 63 set out from the inner face to extend into the path of the hand 56, to move the same about the dial when the frame 61 is rotated. It is to provide against undertaking to move 125 the hand 56 backward that I have fixed the dogs 63 so as to under-act and lift by cam action the hand in the event of the frame being turned backward. The front face of the dogs 63, 63 are disposed to engage the 130



end of the hand 56 and move the same positively to the clock face.

It will be seen that a clock constructed in accordance with this invention, and as above described, is at all times ready to be wound, this being accomplished by grasping the handle 16 and rotating the same, transmitting the rotary action through the gears 13 and 14, the opposite ends of the springs 10 being anchored to the arbor 6 upon which the gear 13 is fixedly mounted, and the spring barrel 9 to which the wheel 7 of the time mechanism is fixedly attached. When the spring is thus wound it is relatively anchored to the slow moving time mechanism. When the winding mechanism is released by the hand of the operator, the spring immediately tends to unwind or expand backward through the gear 8. This action is prevented by the engagement of the leaf spring 49 with the lip 52, the leaf spring being held in a depressed position, as shown in Fig. 1 of the drawings. Hence it is, that the winding of the spring by the handle 16 at one operation winds the spring which is ready at all times to operate the time mechanism, and when permitted, the alarm mechanism.

The winding of the spring is accomplished without operating the alarm operating mechanism connected with the wheel 36, by the avoidance of the wheel 33, which is moved backward out of engagement with the wheel 36, as above set forth, when the gear 8 is rotated in a manner to wind the spring 10. This is the purpose of the loose mounting of the wheel 33 above described, and as shown in Figs. 4 and 6 of the drawings.

The alarm mechanism operates only when the teeth 50 aline with the indentations 26 provided in the wheel 46 to receive them. When this alinement occurs the leaf spring 49 forces the wheel 47 outward until the fingers 54 release the lip 52, permitting the train of gears operating the star wheel 41 and the hammer 43 to operate the same. This operation continues, repeatedly striking the bell 64 and sounding an alarm until the body portion of the cam 24 strikes against the head 27 of the lever 28. When this conjunction occurs the cam 24 is arrested, and with it the power transmission train operating the said alarm.

The body portion is brought into contact with the head 27 by reason of the extensions 22, 22 having engaged the teeth 65, 65, as in the manner of gear teeth, moving the cam 24 and the cams 25 past the head 27 during one complete rotation of the gear 8, there being three of the teeth 65 and three of the extensions 22.

When the alarm operating mechanism is released, the gear wheel 8 is rotated in the direction shown by the arrow in Fig. 6. For

each alarm the gear 8 rotates one complete rotation. In this revolution the three extensions 22, 22 engage the teeth 65, 65 of the cam 24 successively, moving the cam in the direction opposite the rotation of the gear 8. For each movement of the cam 24 by the extensions 22, the head 27 of the lever 28 is lifted over the cam 25, the spring section 29 of the lever 28 permitting the head 27 to thus rise. The head 27 strikes into the recess between the next succeeding cam 25 to aline and hold the cam 24 after being disengaged by one of the extensions 22. This action holds the cam 24 in position so that the following tooth 65 is in the path of the following extension 22. The operation of the second extension 22, in moving the cam 24, is the same as above described. This action is repeated by the three extensions 22 in their engagement with the teeth 65, 65, the last extension 22 placing the head 27 in the recess between the last cam 25 and the end 67. When now the next extension 22 impinges upon the cam 24, it strikes upon the body portion in which there are no teeth, and which arrests the movement of the gear 8, and the extensions 22 carried thereby.

When the spring 10 is re-wound, the gear 8 is moved by the arbor 6 in the direction opposite that shown by the arrow in Fig. 6. As above stated, this movement of the gear 8 does not operate the train of gears connecting the same with the alarm, by reason of the fact that the gear 33 is moved out of contact with the pinion 36. In thus rewinding the spring 10, the extensions 22, 22 reverse the cam 24 engaging the teeth 65, 65 from the direction opposite that previously described. The extensions 22, 22 place the cam 24 and the head 27 in the position shown in Fig. 6 of the drawings. The gear 8 is arrested in this position by the extension 22 striking upon the side of the cam 24 between the first tooth 65 and the end 67. In this position the gear 8 remains stationary until the alarm operating mechanism is released.

It will be noticed that during the operation, and at the beginning of the winding operation just above described, the wheel 33 is forced out of engagement with the wheel 36, thereby avoiding the operating of the star wheel 41 and hammer 43 through the train of gears connected therewith. This operation is repeated for each winding of the clock, the winding having the effect of winding the main spring to operate both the time mechanism and the alarm mechanism.

If it is desired that the alarm be not operated, the hand 56 is moved until it passes over and impinge upon the end of the extension 66 set up from the end of the spring 49. The hand 56 being thus set over and resting upon the spring 49, it is not permitted to rise when the teeth 50, 50 aline with the



indentations 26 formed in the wheel 46, and being thus controlled the lip 52 of the oscillator 44 is imprisoned, and the alarm mechanism prevented from operating. Thus, by moving the hand 56 the alarm may be adjusted to occur at any minute desired by the operator, and by the further movement of the said hand the alarm may be prevented from operating.

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

1. An alarm clock, comprising a latch for holding the alarm operating mechanism from acting; a device operated by the time mechanism for releasing the said latch; a mechanism for actuating the releasing device embodying an extended clock hand to indicate the hour upon the clock dial; a separate hand to indicate the minutes; a gear train connecting said hands to cause same to move in time relation; and a rotatable frame mounted on said clock adapted to engage one of said hands to move the same to set the actuating mechanism relatively to the time mechanism, said frame adapted to engage said hand to move same in one direction only.

2. An alarm clock, comprising a latch for holding the alarm operating mechanism from acting and extended outward through the clock dial; a device operated by the time mechanism for releasing the said latch; a mechanism for actuating the releasing device embodying an extended clock hand to indicate the hours upon the clock dial, said hand adapted to rest over and depress said latch to prevent same from releasing the alarm operating mechanism; and a rotatable frame mounted on said clock adapted to engage said hand to move the same to set the actuating mechanism relative to the time mechanism and when desired over the said latch.

3. An alarm clock, comprising a hollow tube mounted upon the clock frame concentric with the arbor carrying the hour hand of the clock; suitable gear connection between said tube and the arbor upon which the power spring is wound; a key adapted to fit within the hollow of said tube to engage the said arbor therein and having a head extended beyond said tube whereby the said key may be rotated to shift the hands of the clock or be withdrawn from said tube; a loop pivotally mounted in said tube adapted to throw over the end of said key to prevent the withdrawal thereof; a bell supporting frame secured to the clock frame and forming a bearing for said tube; and a bell adapted to be secured upon said bell frame.

4. An alarm clock, comprising a spring actuated releasing device; a holding latch for the alarm operating mechanism; a disk

loosely mounted on the hand posts of the clock and provided with surface irregularities to operate on the said latch to cause the same to release the said alarm operating mechanism; a gear wheel fixedly attached to said disk; a setting hand fixedly attached to said disk and extending across the face of said clock to aline with the hour and minute markings thereof; a supplemental dial formed on the clock face and divided into sixty divisions; a hand rotatably mounted on said face concentric with said supplemental dial to aline with the said markings thereof; a gear wheel fixedly attached to said hand on said clock face held in toothed engagement with the gear wheel on said disk, the toothed relation of said wheels being one to twelve; a casing rotatably mounted on the frame of the clock concentric with the said face thereof; and engaging members fixedly mounted on said frame to extend in the path of said setting hand to move the same when the frame is rotated.

5. An alarm clock, comprising an alarm operating mechanism embodying a releasing device operated by the time mechanism of said clock; a time mechanism for said clock arranged to release the said alarm operating mechanism; a power spring operatively connected to both the said alarm operating mechanism and the said time mechanism; a mechanism for winding said spring; and a yielding wheel interposed between the said spring and alarm operating mechanism disposed to move out of engagement therewith when the said spring is wound.

6. An alarm clock, comprising an alarm operating mechanism embodying a releasing device operated by the time mechanism of said clock; a time mechanism for said clock arranged to release the said alarm operating mechanism; a power spring operatively connected to both the said alarm operating mechanism and the said time mechanism; a mechanism for winding said spring; a movable gear wheel operatively connected with said mechanism for winding said spring and removably connected thereto; and elongated bearings for said wheel concentrically arranged with one of the gears connected by said removable wheel.

7. An alarm clock, comprising an alarm operating mechanism embodying a spring; a vibrating arm; a winding mechanism for said spring; a train of gears actuated by said spring and operatively connected with said vibrating arm; and a swinging arm providing a bearing for one of said gears and adapted to permit the removal of the said gear mounted thereon from engagement with the remainder of said train of gears.

8. An alarm clock, comprising an alarm mechanism embodying the main spring of said clock; a vibrator; a train of gears oper-



atively connecting said main spring and vibrator; a winding mechanism for said main spring; a yielding mounting for one of the gears of said train to permit the removal of  
5 said gear from engagement with the members of said train when said spring is being wound by the said winding mechanism.

9. An alarm clock, comprising a hollow tube mounted concentric with the arbor carrying the hour hand of the clock, said arbor  
10 being extended within the said tube; suitable connection between the said tube and arbor of the power spring whereby the latter is rotated when the said tube is revolved;  
15 a key adapted to rest within the hollow of

said tube to fixedly engage the said arbor to shift the clock hands thereby, said key having a head extended beyond the said tube; a bell supporting frame secured to the clock frame and forming a bearing for said tube; 20 and a bell adapted to be secured upon said bell frame.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ACHILLE KAISERMAN.

Witnesses:

FRED C. KUNASCH,  
WILLIAM WALTER COBB.