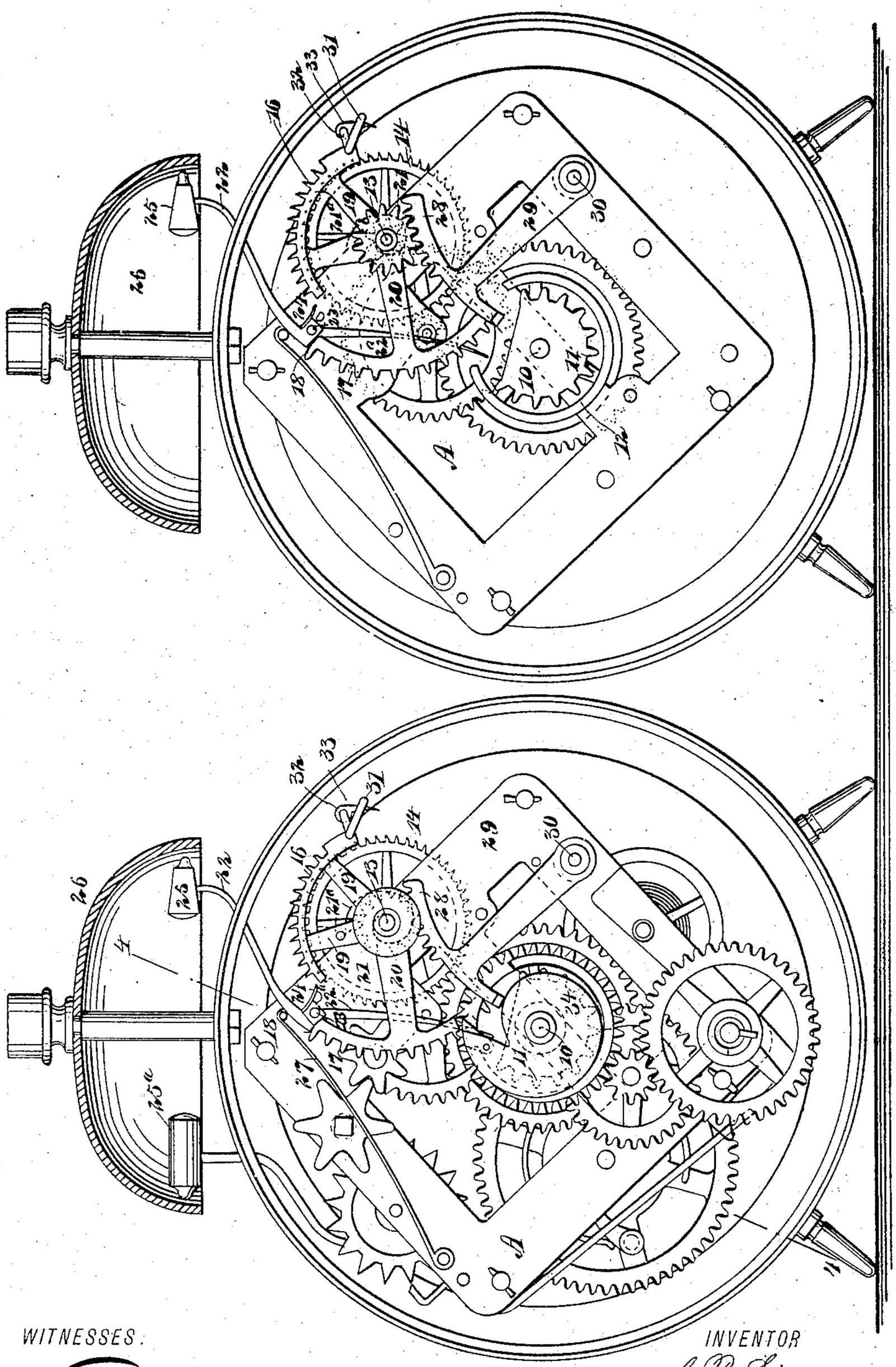
(No Model.) 2 Sheets—Sheet 1.

# C. R. SING.

## CLOCK STRIKING MECHANISM.

No. 568,213. Patented Sept. 22, 1896.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

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## CLOCK STRIKING MECHANISM.

No. 568,213. Patented Sept. 22, 1896.

Fig. 3.

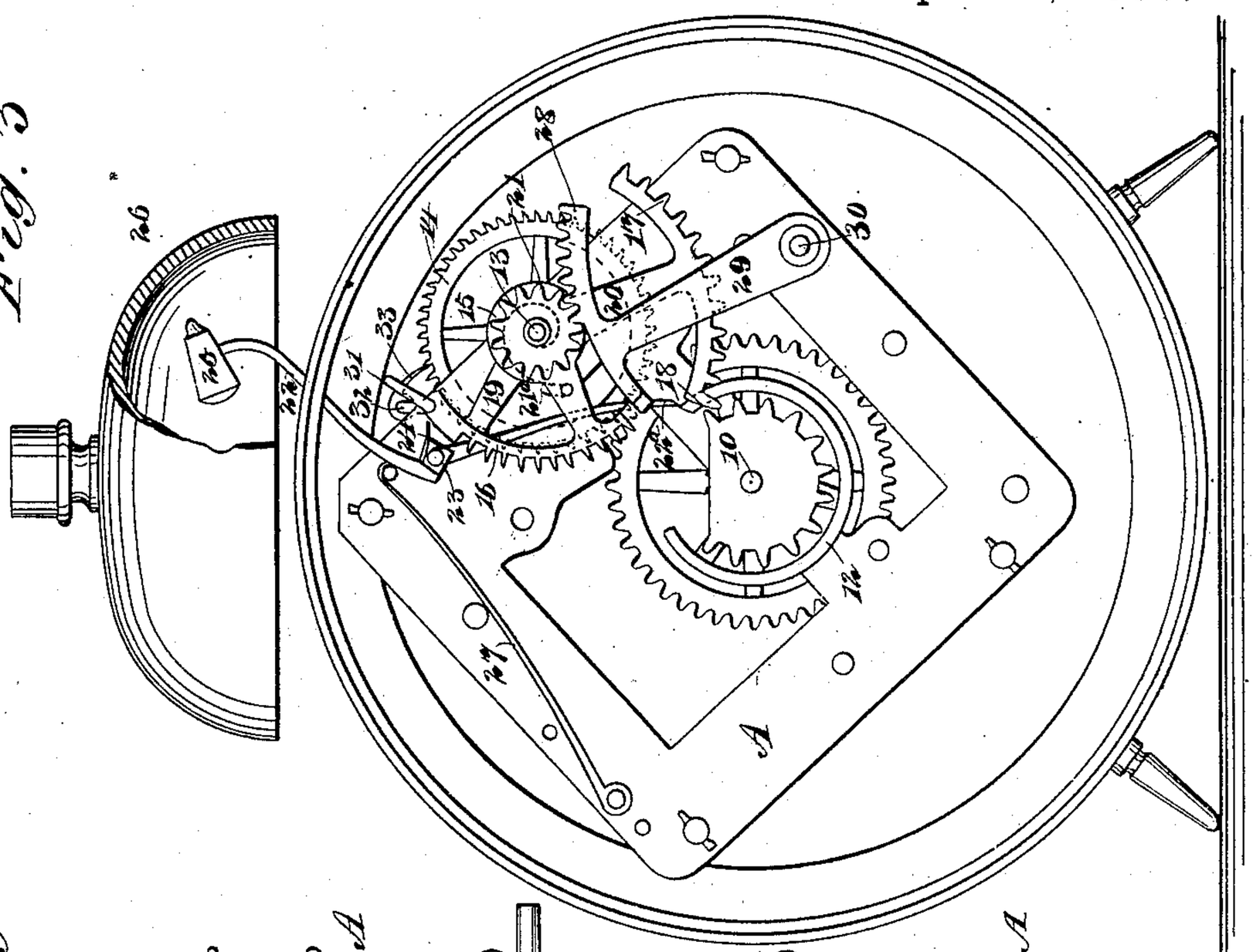


Fig. 5

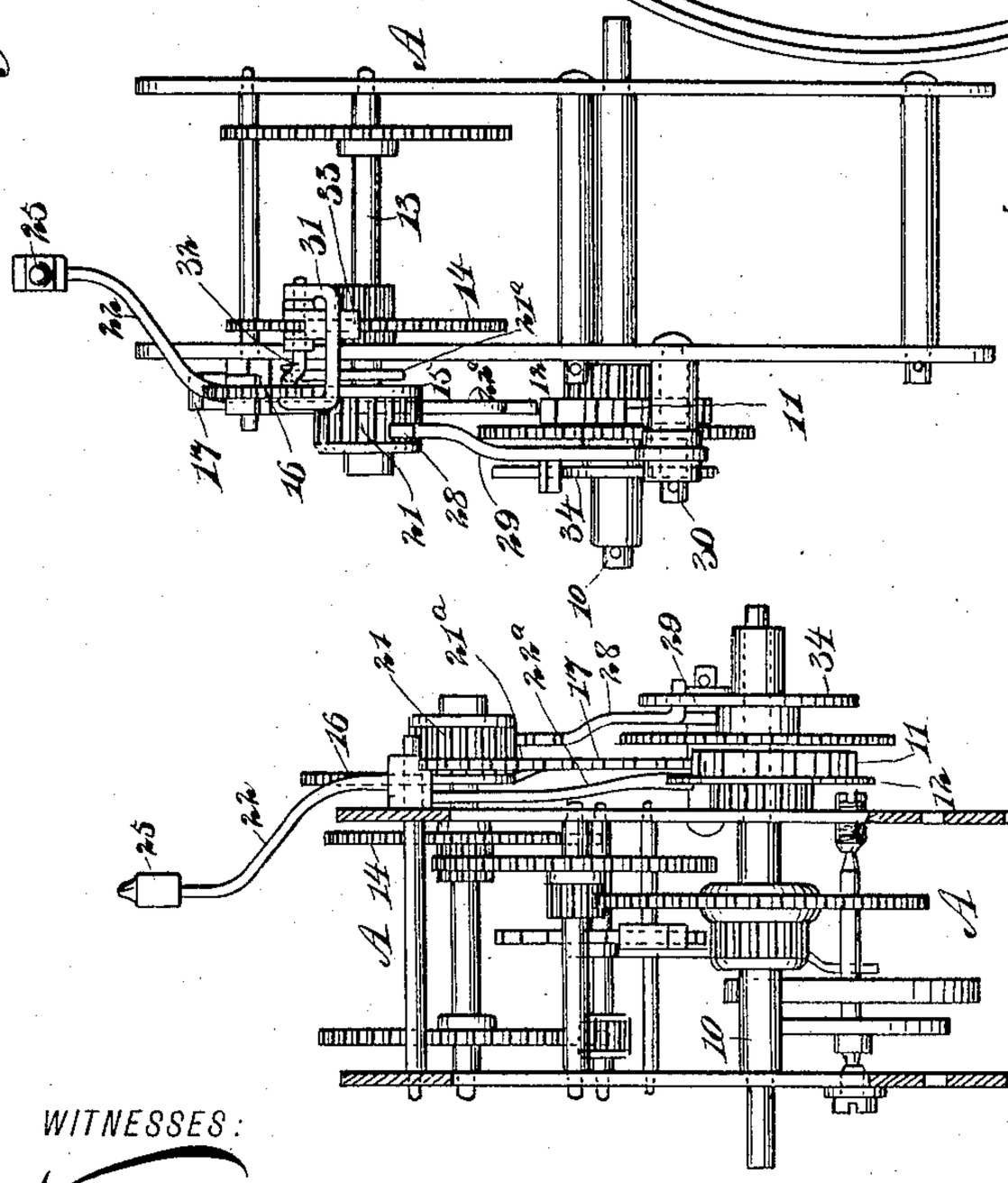


Fig. 7.

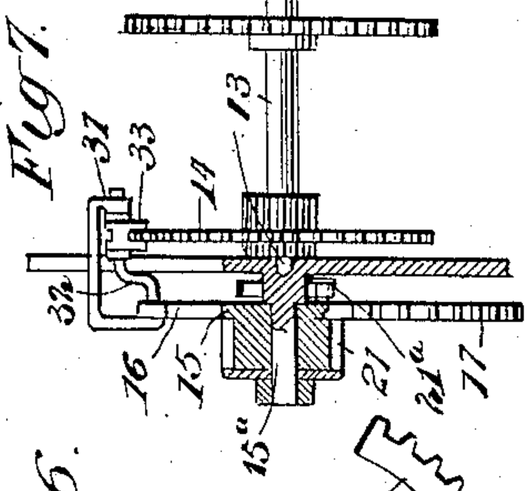


Fig. 4

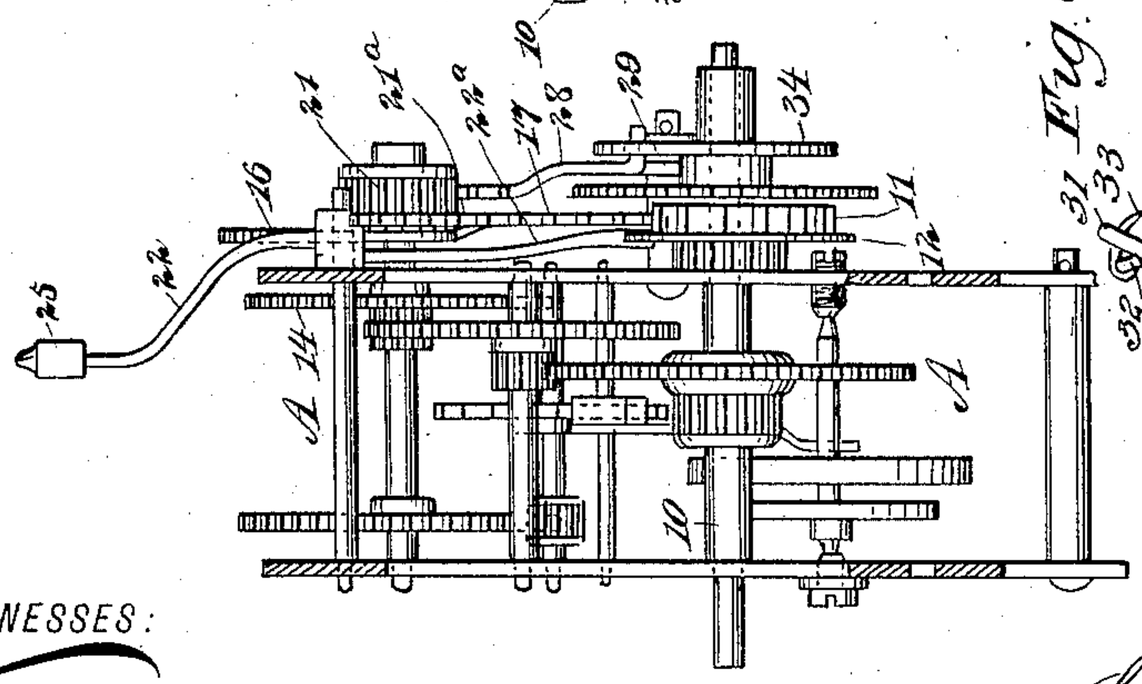
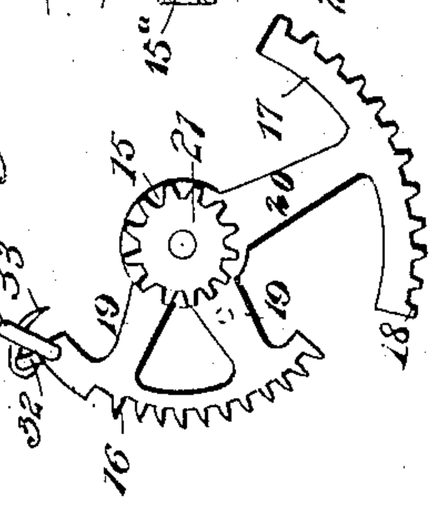


Fig. 6.



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# UNITED STATES PATENT OFFICE.

CHARLES R. SING, OF BRANFORD, CONNECTICUT.

## CLOCK STRIKING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 568,213, dated September 22, 1896.

Application filed June 3, 1896. Serial No. 594,072. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES R. SING, of Branford, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Striking Attachments for Clocks, of which the following is a full, clear, and exact description.

The object of my invention is to provide a striking attachment adapted to be applied to ordinary clock mechanism, which mechanism may have an alarm connected with it, if desired, the striking mechanism being so arranged that it will be exceedingly simple, durable, and economic, comprising but few parts, and the pieces being so arranged as not to burden the driving mechanism of the clock to any appreciable extent.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

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 figures.

Figure 1 is a front elevation of a clock mechanism and the striking mechanism applied thereto, the clock mechanism shown being that which is used in an ordinary alarm-clock. Fig. 2 is a view similar to Fig. 1, illustrating mainly the attachment, the major portion of the works of the clock mechanism proper being removed in the interest of clearness and the position of the parts of the attachment being the same as shown in Fig. 1, in which the striking attachment is shown in operation. Fig. 3 is a view similar to Fig. 2, in which the striking attachment is illustrated as in the position the parts thereof occupy just previous to the said parts being brought into striking action. Fig. 4 is a section taken substantially on the line 4 4 of Fig. 1. Fig. 5 is an edge view of a portion of the clock mechanism and the striking attachment. Fig. 6 is a detail view of the winding and striking segments, and Fig. 7 is a detail view of a portion of the frame of the clock mechanism and a sectional and partial edge view of the striking and winding segments mounted thereon.

In carrying out the invention the clock mechanism A may be of any approved type, and upon the front of the hour-post or main shaft 10 a mutilated gear 11 is secured, which is preferably cut diametrically, so as to present a flat surface at a point beyond its center, as shown in Figs. 1 and 2, and preferably this gear is provided with twelve teeth. A broken or mutilated ring 12 is secured to the aforesaid gear 11 at or near the rear face of the same and extends outward beyond the teeth of the gear, the parting in the ring being over the flat surface of the said gear, and one end of the said ring, that end which faces the direction of travel, is longer than the opposing end, which extends over the aforesaid flat surface of the gear, as is particularly shown in Figs. 2 and 3.

On the second wheel-shaft 13 of the clock mechanism a spur-wheel 14 is rigidly secured, and the teeth of the said wheel are provided with beveled faces upon that side presented to the direction of rotation, the opposite faces of the aforesaid teeth being preferably straight, as shown in Figs. 1, 2, and 3. A disk 15 is loosely mounted in any suitable or approved manner upon a post $15^a$, as shown in Fig. 7, secured upon the front portion of the frame of the clock mechanism, independent of and preferably in line with the front end of the second wheel-shaft 13. Two segments 16 and 17 are connected with the said disk by means of arms designated, respectively, as 19 and 20. The upper segment 16 is the striking-segment, while the other segment is a winding-segment for the striking mechanism. A space is made to intervene the opposing ends of the striking and the winding segments. The winding-segment is farther removed from the disk than the striking-segment, and to such an extent that if the circle of the two segments were continued the circle of the striking-segment would be well within that of the winding-segment. Each of the two segments is preferably provided with twelve teeth, but the end tooth of the winding-segment, designated as 18, and which is nearest to the striking-segment, is longer than the other teeth on the aforesaid winding-segment, as illustrated particularly in Figs. 1, 2, and 3. A pinion 21 is secured upon the outer face of the segment-carrying disk 15, being also loosely mounted upon the post $15^a$, and a spring $21^a$ is coiled around the said post $15^a$ at the back of the segment-carrying disk or

hub 15, being secured at one end to the said post 15ª and at its opposite end to the striking-segment 16. A controlling-segment 28, attached to an arm 29, is located below the pinion 21, and the arm of the segment is pivoted to the front face of the frame of the clock mechanism, the pivot being shown at 30 in the drawings. The segment is provided with the necessary number of teeth, and these teeth are constantly in mesh with the pinion 21.

A yoke 31 is attached to the striking-segment 16 at what may be termed its "outer end," and this yoke extends within the casing of the clock over the spur-wheel 14 on the second wheel-shaft. An arm 32 is likewise secured to the striking-segment 16 and extends in the same direction as the yoke 31, being separated slightly from the said yoke, and on this yoke 32 a spring-controlled or gravity pawl 33 is mounted, adapted for engagement with the teeth of the spur-wheel 14, the yoke 31 preventing the said pawl from flying outward beyond a certain distance. In fact the yoke 31 serves as a guard for the aforesaid pawl 33.

The striking-arm 22 is shown as pivoted at a point 23 upon the front of the frame of the clock mechanism, and the said striking-arm is provided with a projection 24 near its pivot to engage with the teeth of the striking-segment 16 and enter the space between the teeth of the said segment. A hammer 25 at the outer or free end of the striking-arm 22 is of any approved construction and is adapted to engage with a gong 26, which gong is shown in the drawings and may be that upon which the alarm is sounded by an alarm-clock through the medium of a second hammer 25ª. The striking-arm 22 is held by the spring 27, so that its projection 24 will be compelled to engage with the teeth of the striking-segment when a downwardly-projecting arm 22ª, attached to the bottom portion of the striking-arm, is not in engagement with the outer face of the mutilated ring 12, connected with the hour-post or main shaft. The said extension-arm of the aforesaid striking-arm is shown in engagement with the ring in Fig. 3 and out of engagement with the same in Fig. 2.

The snail 34 or other form of regulator for the striking mechanism that may be employed is mounted loosely upon the hour-post or main shaft in the usual way, being driven from the gearing of the clock mechanism as customary, and the said snail or striking-regulator at its regulating-surface is to be engaged by the inner end of the controlling-segment 29, the depth of the spiral in the snail regulating the number of strokes that the hammer 25 will give on the bell 26.

The position of the striking mechanism just after the hour has been struck is that shown in Figs. 1 and 2. At a predetermined time before the next hour is reached the broken ring 12 will have revolved together with the pinion 11 a sufficient distance to release the downwardly-projecting portion of the striking-arm 22, as shown in Fig. 3, bringing the outer projection or lip 24 of the said striking-arm in position to engage with the teeth of the striking-segment, the winding-segment having meanwhile acted to carry the striking-segment inward to the position shown in said Fig. 3, the lip 24 of the striking-arm resting upon the first wide tooth of the striking-segment. The teeth of the mutilated pinion 11, which have been in engagement with the teeth of the winding-segment 17, will at this moment engage with the winding-segment only by its longer tooth 18, the said tooth being given extra length to clear the pinion 11 from the remaining teeth of the segment. The outward movement of the winding-segment will serve to coil the spring 21ª. Before the last and longest tooth 18 of the winding-segment has left the pinion 11 the hammer 25 will be released from the mutilated ring 12, enabling the striking-segment to travel inward and the lip 24 of the striking-arm passing from tooth to tooth on the striking-segment until the hour has been sounded. The tendency of the spring 21ª will be to turn the said striking-segment in an outward direction, or in direction of the traveling spur 14, and the pawl 33, connected with the striking-segment will engage with the tooth of the said spur-wheel 14, and the latter wheel will serve to regulate the movement of the striking-segment in its outward rotation. As the striking-segment thus rotates, as heretofore stated, the lip 24 of the striking-arm passing from tooth to tooth of the striking-segment will cause the hammer 25 to strike an alarm upon the gong 26. As the lip 24 passes each of the said teeth the alarm will continue to be sounded until the controlling-segment engages with the regulating-wall of the snail 34, or whatever equivalent of the same that is employed.

It will be observed that the spring 21ª relieves from all strain the ordinary mechanism of the clock, and that the spur-wheel 14 serves to regulate the pulsation of the striking-arm, and when the proper number of strokes has been given to indicate the hour the pawl 33 will simply slip over the teeth of the spur-wheel 14, offering no resistance thereto.

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

1. In a clock mechanism, the combination, with the hour-post or main shaft, and a snail or like device loosely mounted on the said post or shaft, of a segmental hammer-releasing device, a hammer-arm adapted to be engaged by the said releasing device, and a gear having a portion of its surface broken away, moving with the aforesaid releasing device, a spring-controlled striking-segment arranged for engagement with the striking-arm, a winding-segment connected with the striking-segment and operated from the hour post or shaft gear, and a controlling-segment operated by the movement of the striking-segment and

being adapted for engagement with the aforesaid snail, as and for the purpose set forth.

2. The combination, with the hour-post or main shaft of a clock mechanism, a segmental releasing device secured thereto, a mutilated gear moving with the said device, a seconds-hand shaft of the said clock mechanism, and a spur-wheel carried by the same, of a striking-arm adapted for engagement with the segmental release, a hub loosely mounted on a fixed support, a winding and a striking segment carried by the said hub, the winding-segment being adapted for engagement with the mutilated gear of the hour-post or main shaft, the striking-segment being adapted for engagement with the striking or hammer arm, a spring connected with a fixed support and one of the said segments, being wound during the engagement of the winding-segment with the aforesaid mutilated gear, and a controlling-segment operated from the aforesaid hub, a snail or like device adapted to be engaged by the controlling-segment, and a ratchet connection between the striking-segment and the spur-wheel on the seconds-wheel shaft, as and for the purpose set forth.

3. In a clock mechanism, a spring-controlled striking-segment, a winding-segment operating in conjunction with the striking-segment and operated from the hour-post or main shaft of the clock mechanism, the striking-segment being regulated in its striking movement by the rotation of the seconds-wheel shaft of the said clock mechanism, and a stroke-regulating device operated by the movements of the striking and the winding segments, as and for the purpose set forth.

4. In a clock, the combination with a frame and a gong, of a driven shaft, a regulator on the shaft, a toothed sector mounted on the frame and coacting with the regulator, a toothed striking-sector coacting with the first-named sector, means for raising the toothed striking-sector by movement derived from the driven shaft, a pivotally-mounted hammer, and a broken ring carried by the driven shaft and capable of temporarily holding the hammer out of engagement with the toothed striking-sector, substantially as described.

5. In a clock, the combination with a frame and a gong, of a driven shaft, a toothed sector, a regulator carried by the driven shaft and coöperating with the sector, a toothed striking-sector with which the first-named sector is connected, means for turning said striking-sector by movement derived from the driven shaft, a pivotally-mounted hammer capable of being engaged by the striking-sector, and a broken ring carried by the driven shaft and capable of temporarily holding the hammer out of engagement with the striking-sector, substantially as described.

6. In a clock, the combination with a frame and gong, of a driven shaft, a toothed sector, a regulator operated by the driven shaft and coacting with the sector, a toothed striking-sector connected with the first-named sector, means for operating the striking-sector, a pivoted hammer with which the striking-sector is capable of engagement, and means for temporarily holding the hammer out of engagement with the striking-sector, substantially as described.

7. In a clock, the combination with a frame and gong, of a driven shaft, a regulator carried by the shaft, a broken ring carried by the shaft, a toothed sector coöperating with the regulator, a toothed striking-sector with which the first-named sector is connected, means for operating the toothed striking-sector, a pivotally-mounted hammer with which the striking-sector is capable of engagement and an arm fixed to the hammer and engaged by the broken ring, substantially as described.

8. In a clock, the combination with a frame and gong, of a driven shaft, a striking-sector operated and regulated from the shaft, a pivotally-mounted hammer with which the striking-sector is capable of engagement, and a member carried by the driven shaft and having a curved and mutilated periphery, said periphery engaging the hammer and being capable of temporarily holding the same out of engagement with the striking-sector, substantially as described.

9. In a clock, the combination with a frame and gong, of a driven shaft, a regulator carried by the shaft, a toothed sector coöperating with the regulator, a toothed striking-sector connected with the first sector, means for operating the striking-sector from the driven shaft, a pivoted hammer with which the striking-sector is capable of engagement, and a member carried by the driven shaft and having a curved and mutilated periphery with which periphery the clapper engages and whereby the clapper is temporarily held out of engagement with the striking-sector, substantially as described.

10. In a clock, the combination with a frame and gong, of a driven shaft, a regulator carried by the driven shaft, a toothed sector cooperating with the regulator, a toothed striking-sector in connection with the first-named sector, means for operating the striking-sector from the driven shaft, a continuously-driven spur-wheel adjacent to the striking-sector, a pawl carried by the striking-sector and capable of engaging the spur-wheel, a pivotally-mounted hammer with which the striking-sector is capable of engagement, and a member carried by the driven shaft and having a curved and mutilated periphery capable of engaging the hammer and of temporarily holding the same out of engagement with the striking-sector, substantially as described.

11. In a clock, the combination with a frame and gong, of a driven shaft, a toothed striking-sector operated and regulated from the shaft, a continuously-moving spur-gear adjacent to the striking-sector, a pawl carried by the striking-sector, and capable of engag-

ing the gear, and a hammer capable of being engaged and operated by the striking-sector, substantially as described.

12. In a clock, the combination with a frame and gong, of a driven shaft, a toothed sector, a regulator carried by the shaft and coöperating with the sector, a toothed striking-sector connected with the regulator, a continuously-moving spur-wheel adjacent to the striking-sector, a pawl carried by the striking-sector and capable of engaging the spur-wheel, a hammer with which the striking-sector is capable of engagement, and a member carried by the driven shaft and having a curved and mutilated periphery engaging the hammer to temporarily hold the same out of engagement with the striking-sector, substantially as described.

CHARLES R. SING.

Witnesses:
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LUCIEN A. MERRIAM.