(Model.) 3 Sheets—Sheet 1.

S. WILLCOCK.

REPEATING CLOCK.

No. 488,103. Patented Dec. 13, 1892.

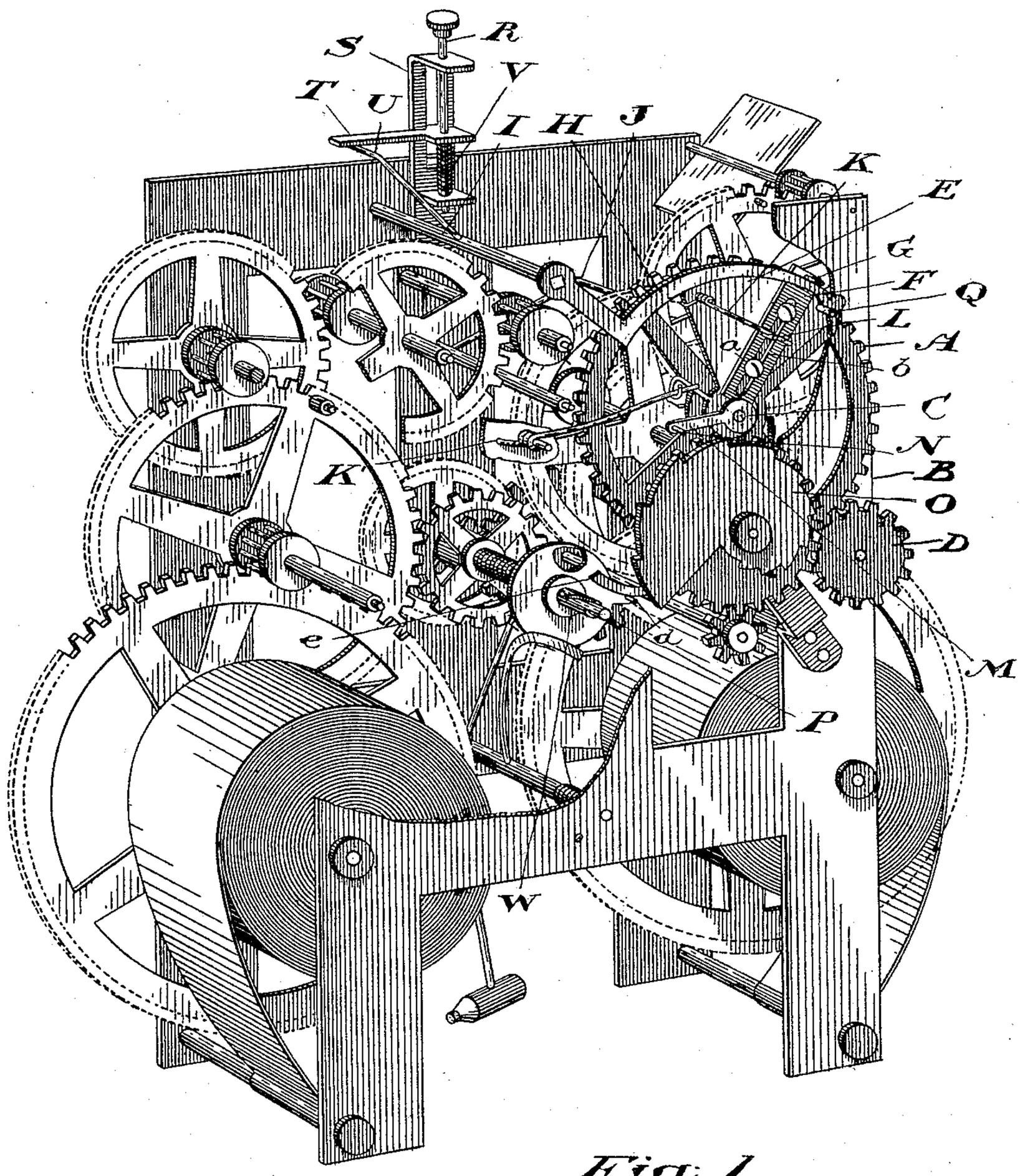

Fig. 1.

Witnesses

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(Model.)

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Fig. 2

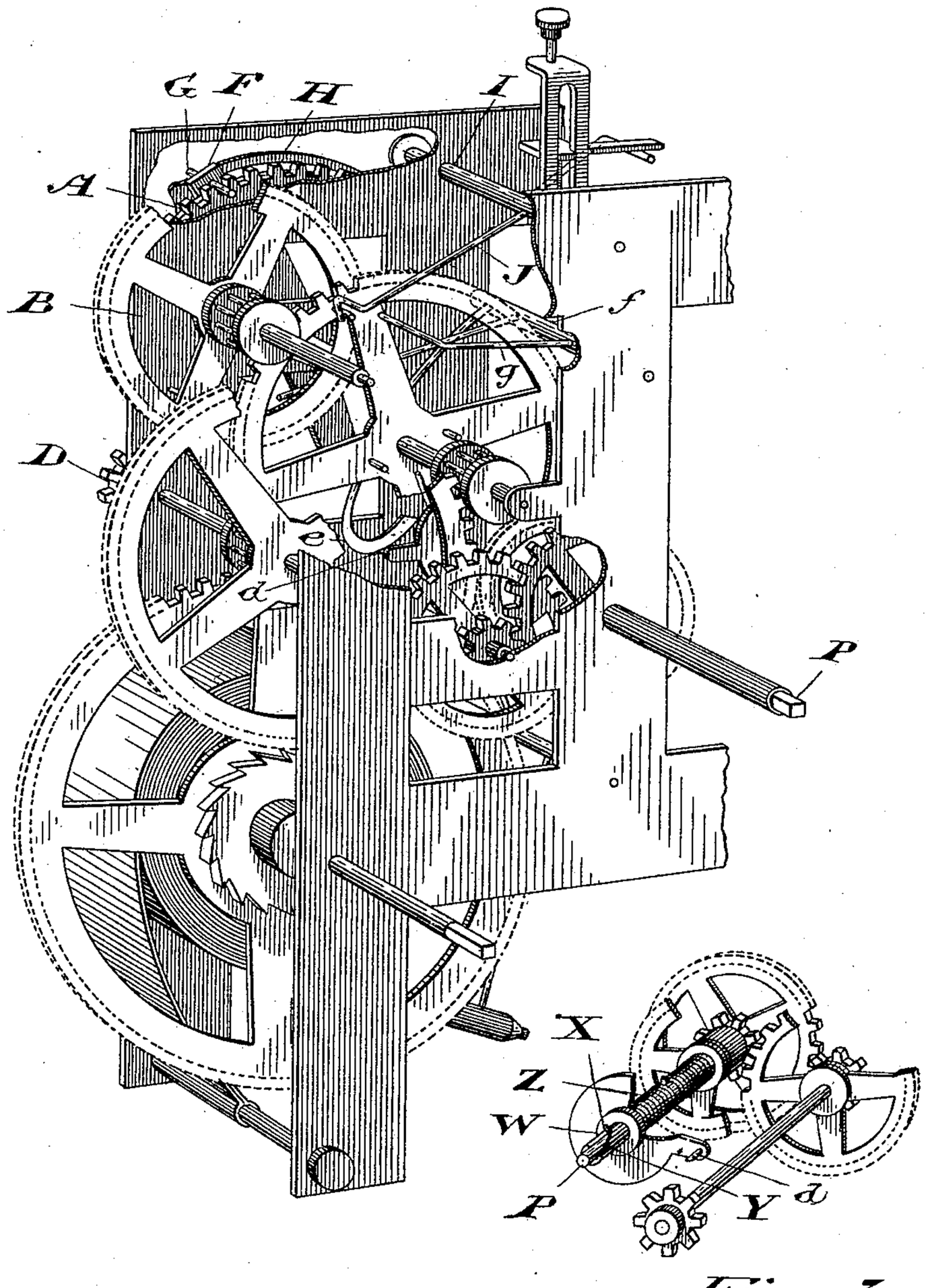

Fig. 3

Witnesses

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(Model.)

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Fig. 4.

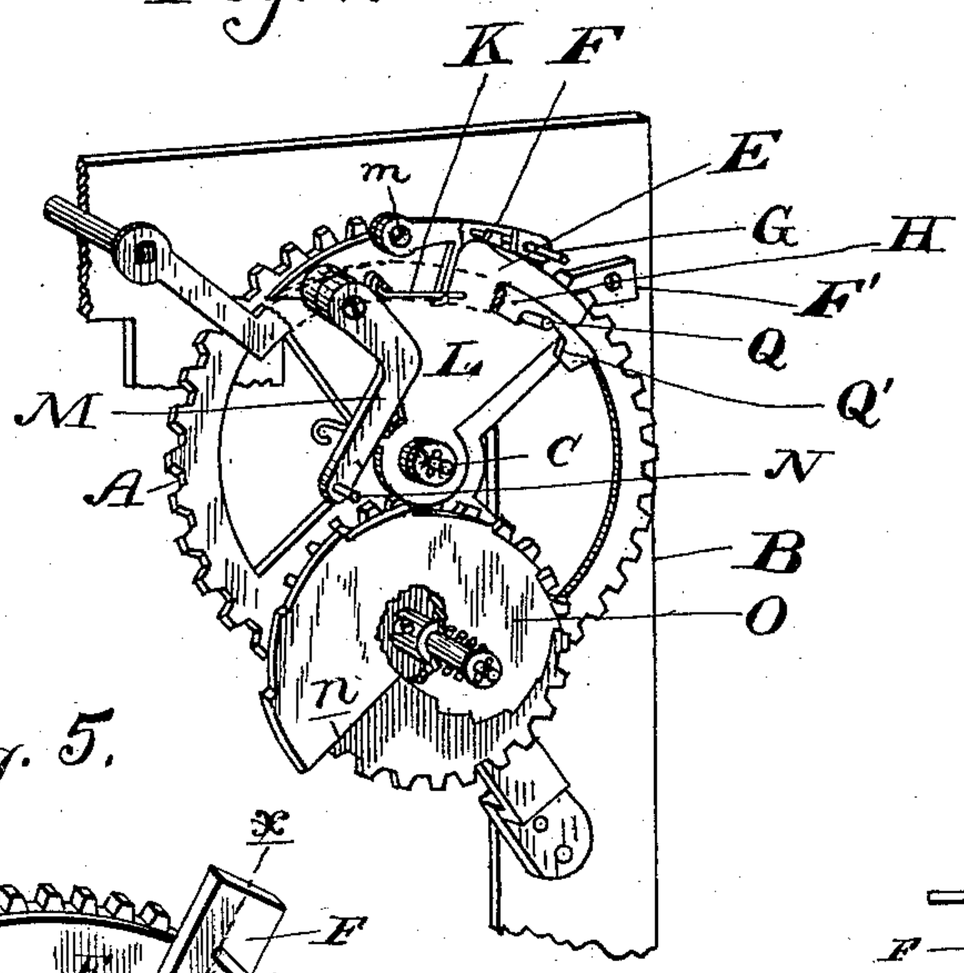


Fig. 5.

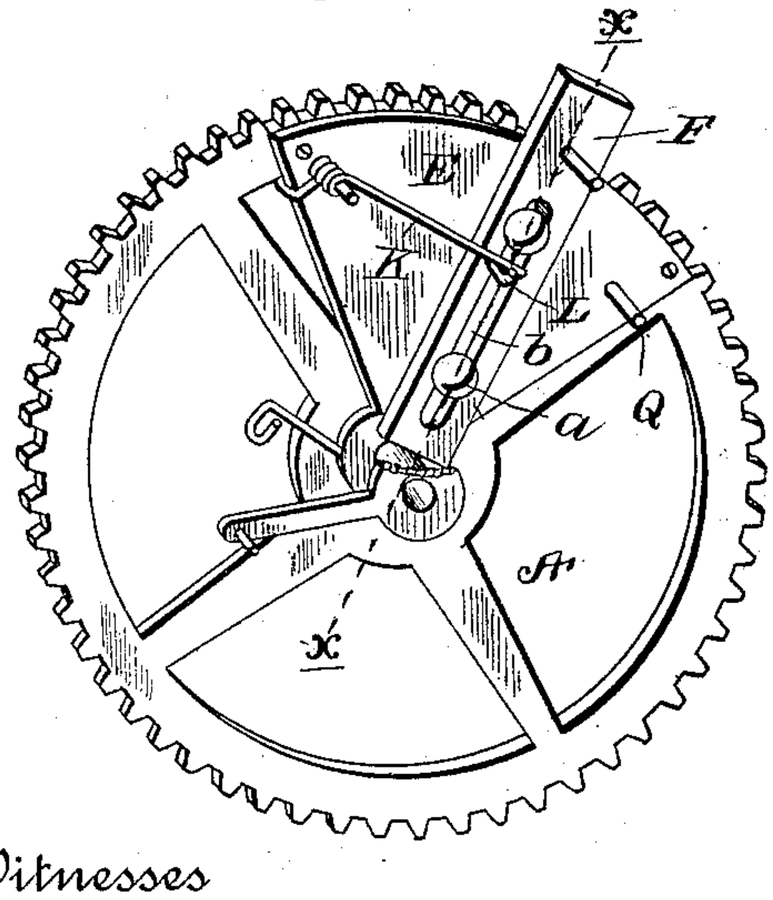
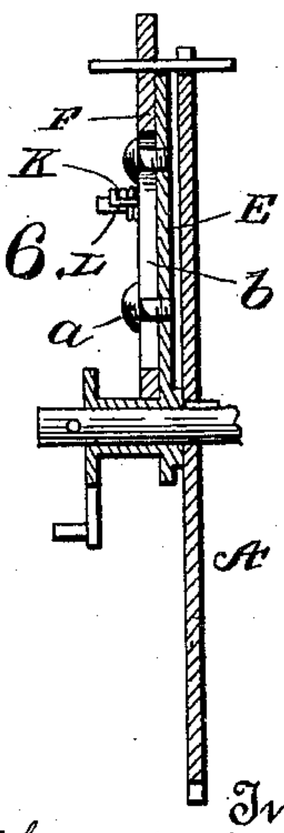


Fig. 6.



Witnesses
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UNITED STATES PATENT OFFICE.

STEPHEN WILLCOCK, OF TORONTO, CANADA.

REPEATING-CLOCK.

SPECIFICATION forming part of Letters Patent No. 488,103, dated December 13, 1892.

Application filed May 5, 1892. Serial No. 431,916. (Model.)

To all whom it may concern:

Be it known that I, STEPHEN WILLCOCK, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented a certain new and useful Improvement in Repeating Clocks or Watches, of which the following is a specification.

My invention relates to improvements in the striking mechanism of repeating clocks or watches; and the object of the invention is to construct the mechanism so that the rack, the gathering pin or tumbler, and the stop lever or dog now commonly used in repeating-clocks may be dispensed with; and it consists, essentially, of an ordinary count-wheel geared to the striking mechanism of the clock, a snail geared to the center arbor and arranged in connection with mechanism to release the count-wheel by the starting of the striking mechanism, and of mechanism arranged in connection with the snail to stop the striking mechanism, substantially as hereinafter more particularly explained.

Figure 1 is a perspective view showing the mechanism of the clock with my improvement attached. Fig. 2 is a perspective view of the striking mechanism of the clock from the opposite side of that shown in Fig. 1. Fig. 3 is a detail showing the mechanism by which the movement of the hands may be made to repeat the hour last given. Fig. 4 shows an equivalent arrangement of the mechanism for stopping the striking mechanism. Fig. 5 is a perspective view of the parts for stopping the striking mechanism, and Fig. 6 is a section of the same through the line *x x*.

In the drawings, A represents an ordinary count-wheel suitably journaled on a pin C, projecting from the face of the clock-frame B, the count-wheel deriving motion through the pinion D from the striking mechanism of the clock.

E is a plate loosely journaled on the pin C and projecting toward the periphery of the count-wheel A.

F is a light bar loosely held to the plate E by the heads of the screws *a*, which screws pass through a slot *b* made in the bar F.

G is a pin projecting through the bar F, so that on one side it will engage with the teeth of the count-wheel A and on the other side rest upon the curved finger H, fixed to the spindle I of the locking-arm J.

K is a spring arranged, as indicated, to act upon a pin L, projecting from the face of the bar F. The tension of this spring K holds the pin G in mesh with the teeth in the count-wheel A.

M is a finger fixed to and projecting from the pivoted or journaled plate E.

N is a pin projecting from the finger M over the snail O. This snail is made in the usual manner with twelve steps to represent the twelve hours into which the day is divided, and is geared, as indicated, to the center arbor or spindle P, so that at each revolution of the center arbor P the snail O is moved the distance of one step. As the snail is commonly used in repeating-clocks its purpose is well understood, so that it is not necessary in this specification to give an elaborate description of its use or operation. Suffice it to say that it is arranged in connection with the hands' axle in such a manner that the movement of the hour-hand to any particular numeral on the face of the clock brings the particular step in the snail representing that numeral opposite to the particular part of the mechanism by which the number of the strokes represented by that numeral is regulated. For instance, in the drawings, I show the snail O with its fourth step, counting from the highest point in this snail, immediately below the pin N, the movement of which regulates the stroke.

When the striking mechanism is put into operation in the usual manner by the minute-hand reaching the striking-point on the clock, the locking-arm spindle I is rocked on its pivot, and as the curved finger H is fixed to the said spindle I the said curved finger H is raised so as to come in contact with the pin G and push the said pin clear of the teeth in the wheel A, thereby releasing the plate E, which by the action of the spring K′ is caused to fall until its motion is arrested by the pin N coming in contact with the snail O. As the rocking of the spindle I is merely momentary the curved finger H drops away immediately from the pin G and permits the said pin to re-engage with the teeth of the then-revolving count-wheel A, thereby lock-

ing the plate E to the said count-wheel, which continues to revolve until the pin Q, projecting from the plate E, comes in contact with the end of the curved finger H, so as to raise the said curved finger H, and thereby rock the spindle I so as to throw the locking-arm J in position to stop the striking mechanism.

In Fig. 4 I show an alternative arrangement of the mechanism by which the striking mechanism is stopped by the dropping instead of the raising of the finger H. In this arrangement the bar F is pivoted on the plate L at *m*, instead of being held loosely to the said plate by means of the heads of the screws *a*. When the striking mechanism is to be stopped, the finger H drops by the pin Q coming opposite to a wide notch Q′, made in the finger H, thus bringing the arm J in position to stop the striking mechanism, which action is much quicker than the upward movement caused by the pin Q coming in contact with the enlarged end of the curved finger H. The arm M in Fig. 4 is shown connected to a different part of the plate E, where it may be more readily adjusted. When the pin N is rising on the twelve-o'clock step of the snail and the hands are revolved, some means must be provided to allow the pin N to pass the straight part *n*.

In Fig. 1 the arm M is shown of thin spring metal, and in Fig. 4 the snail is provided with an arrangement similar to that in the center arbor P, which is fully described farther on in the specification. In one case the spring of the arm M allows the pin N to pass behind the snail till it rises to its normal position above the snail, and in the other the forward movement of the snail answers the same purpose.

As there is a possibility that something might occur to prevent the finger H falling by its own gravity when it comes opposite to the notch Q′, I place a projecting piece F′ in the path of the pin G, which in the event of the non-falling of the finger H will raise the said pin clear of the teeth in the count-wheel, which pin will then be moved back until it strikes the finger H, and thus put the stop mechanism into action.

There are various ways of putting the striking mechanism into motion. One plan I show in Figs. 1 and 2 and another plan in Fig. 3.

In Figs. 1 and 2 I show a spindle R, carried in a suitable bracket S. The upper end of the spindle R should project through the clock-case and have a suitable button formed on it. A finger T, fixed to the spindle R, projects over a lever U, projecting from the spindle I. A spring V is placed between the finger T and bottom of the bracket S, so as to support the said finger T in its normal position above the lever U and to carry it back into that position after it has been pressed down to strike the lever U, and by rocking the spindle I put the striking motion into action, as already described.

In Fig. 3 I show another plan by which the striking mechanism is put into action by the movement of the minute-hand to indicate the last hour struck. In this figure will be seen a sleeve W, loosely journaled on the center arbor P, but prevented from revolving thereon by a pin X, projecting from the said axle and fitting into a V-shaped notch Y, made in the end of the sleeve W, as indicated. A spring Z, which is behind the sleeve W, holds the said sleeve so that the pin X shall fit into the notch Y. A finger *d* extends from the sleeve W in the path of the wire *e*. This wire is fixed to the rock-shaft *f*, from which the wire *g* projects, the latter wire being in the path of the locking-arm J.

In order to find out what hour has been struck last, the minute-hand is moved back past the twelve-o'clock numeral on the face of the clock, which movement carries the sleeve back with the center arbor P until the finger *d* on the sleeve W comes in contact with the curved end of the wire *e*, which action holds the sleeve W, and as the center arbor P continues to revolve the pin X, by acting against the side of the V-shaped notch Y, forces the sleeve W back against its spring until the finger *d* is carried clear of the wire *e*, when the spring immediately forces the sleeve W back into its initial position with the pin X behind the wire *e*.

By bringing the minute-hand back to the twelve-o'clock numeral the pin *d* strikes the wire *e*, so as to rock the shaft *f*, moving the wire *g* until it strikes the locking-arm J, thereby starting the striking mechanism of the clock.

What I claim as my invention is—

1. A count-wheel geared to the striking mechanism of a clock, a snail geared to the center arbor and rotated by the time-movement and arranged in connection with mechanism to release the count-wheel by the starting of the striking mechanism, and means, as the finger H, arranged in connection with the snail to regulate the motion of the striking mechanism, substantially as and for the purpose specified.

2. A count-wheel geared to the striking mechanism of a clock and a snail geared to the center arbor, in combination with a plate loosely journaled on the journal of the count-wheel, a bar loosely held to the said plate and provided with a pin to engage with the teeth of the count-wheel, and a finger fixed to and extending from the spindle of the locking-arm, substantially as and for the purpose specified.

3. A count-wheel geared to the striking mechanism of a clock, a snail geared to the center arbor, and a plate loosely journaled on the journal of the count-wheel and provided with a finger having a pin projecting from it in the path of the snail, in combination with a pin projecting from the journaled plate in the path of the curved finger fixed to the spindle of the locking-arm, substantially as and for the purpose specified.

4. A count-wheel A, geared to the striking mechanism of the clock, a journaled plate E, having an arm F loosely connected to it, a pin G, projecting through the bar F and engaging with the teeth in the count-wheel A, and a pin L, projecting from the face of the bar F, in combination with a spring K′ and curved finger H, substantially as and for the purpose specified.

5. The combination, with a sleeve loosely journaled on the center arbor P and having a V-shaped notch made in one end of it and a spring located behind it to hold the sleeve in mesh with the V-shaped notch, of a finger extending from the sleeve to a point in the path of a wire and mechanism to connect the said wire to the locking-arm J, substantially as and for the purpose specified.

Toronto, April 30, 1892.

STEPHEN WILLCOCK.

In presence of—
J. EDW. MAYBEE,
JOHN E. CAMERON.