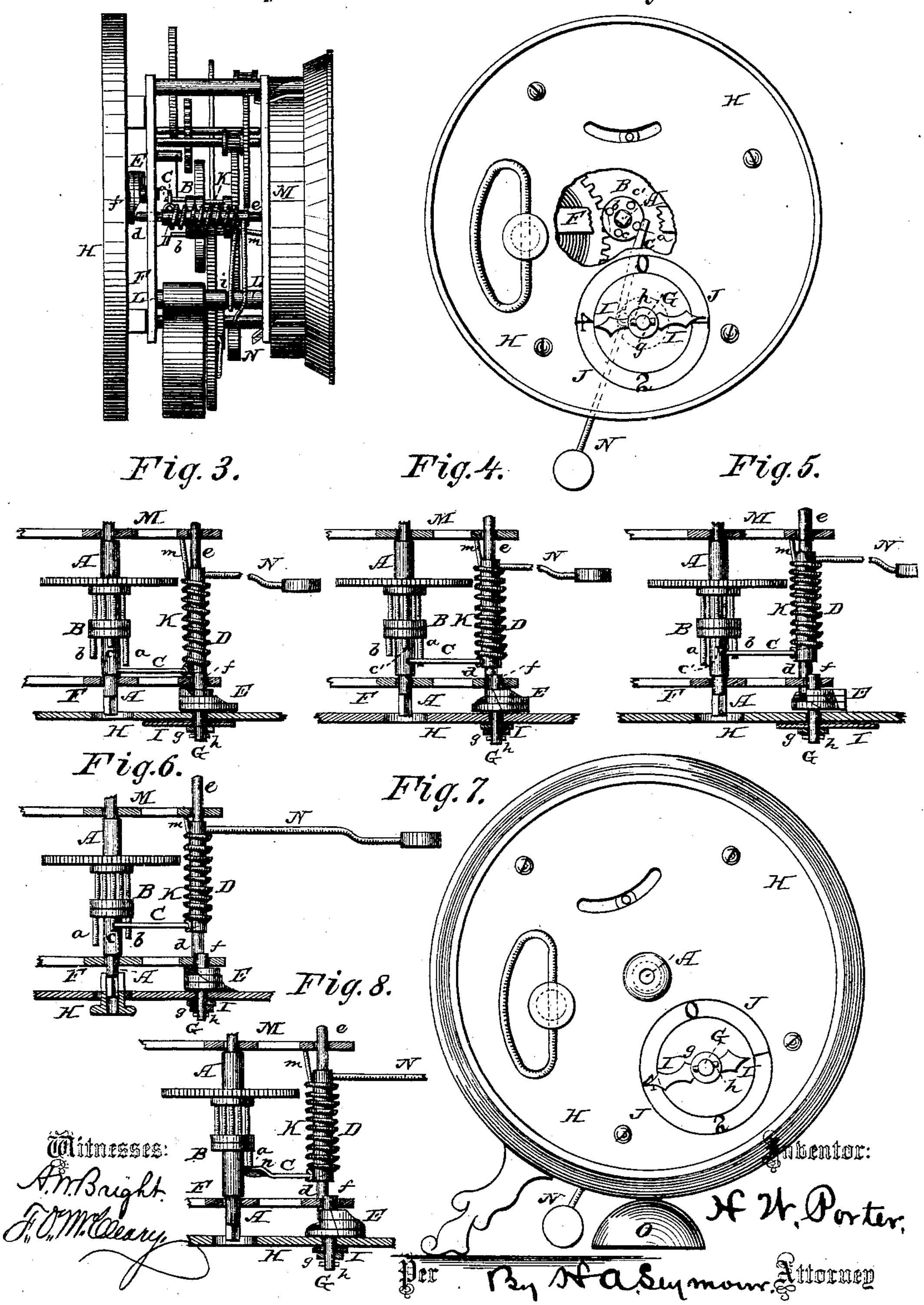
H. W. PORTER.
Clock-Striking Mechanism.

No. 208,333. Patented Sept. 24, 1878.



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HENRY W. PORTER, OF FORESTVILLE, CONNECTICUT.

IMPROVEMENT IN CLOCK-STRIKING MECHANISMS.

Specification forming part of Letters Patent No. **208,333**, dated September 24, 1878; application filed August 27, 1878.

To all whom it may concern:

Be it known that I, HENRY W. PORTER, of Forestville, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Clocks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in clocks, the object being to provide a time clock-movement with a cheap, simple, and effective striking mechanism, that shall be capable of being adjusted to strike every hour or fraction of an hour; and to this end my invention consists, first, in the combination, with the center shaft of a time-movement having a collet or disk attached thereto, which latter is provided with any desired number of pins or studs of varying length, of a sliding strike-shaft, provided with a lift and means for regulating the longitudinal adjustment of the strike-shaft, whereby the lift may be secured in proper position to be raised once or any desired number of times while the center shaft is making a complete revolution.

My invention further consists in the several details of construction and combinations of parts, as will more fully appear from the following description and claims.

In the accompanying drawings, Figure 1 is a side elevation of a clock-movement embodying my invention. Fig. 2 shows the back of the movement with a portion of the frame back plate cut away to more clearly illustrate the relative positions of the several parts of the striking attachment. Figs. 3, 4, 5, and 6 are detached views of the center shaft and sliding strike-shaft, the latter in its different positions for striking every hour, half-hour, and quarter-hour. Fig. 7 is a plan view of the back of the clock. Fig. 8 is a modification.

A represents the center or minute-hand shaft of an ordinary time clock-movement. B is a collet or disk, rigidly secured to shaft A. To the face of the collet are secured the lift-pins *a b c c'*. The lift-pin *a* is the longest of the series, and is designed to raise the lift C on the sliding strike-shaft D, and thus cause the clock to strike once every hour. Pin *b* is slightly shorter than lift-pin *a*, and is secured to the collet B at a point diametrically opposite the pin *a;* and hence, when the sliding strike-shaft D is longitudinally adjusted, so that the lift C will be raised by the lift-pin *b*, then lift C will be raised twice for every revolution of the center shaft and the clock caused to strike every half-hour, by reason of the fact that when the striking mechanism is adjusted for operation lift-pin *a* will raise the lift C once for every revolution of the center shaft. Now by moving the lift C to such a position that it will also be raised by the lift-pin *b*, which is located diametrically opposite lift-pin *a*, it follows that the lift C will be raised twice for every complete revolution of the center shaft, and thus the clock caused to strike every half-hour of the day. *c c'* are short lift-pins, located diametrically opposite each other, and equidistant from the pins *a b*. By moving the lift C laterally, so that it will come in line and be raised by the pins *c c'*, the lift will be successively raised by the pins *a b c c'* during each revolution of the center shaft, thus causing the clock to strike every fifteen minutes.

The striking mechanism may be entirely disconnected from the time mechanism, and hence remain inactive, by moving the lift away from collet and out of range of the longest lift-pin, *a*.

As heretofore stated, the strike-shaft is adapted to be adjusted longitudinally in order to carry the lift C to the desired point of adjustment. To accomplish this result, the strike-shaft D is provided with extended pivotal bearings *d e*. The rear pivot, *d*, rests against a face-cam or spiral, E, which turns on a pin or stud, *f*, attached to the rear clock-frame, F. To the rear face of the cam E is attached a pin, G, which projects through the back H of the clock-case, and has a pointer, I, secured thereto by a washer, *g*, and pin *h*, or by any equivalent means. A dial, J, is stamped or attached to the back of the clock-case and the numerals 0 1 2 4 indicated thereon.

A spiral spring, K, surrounds the strike-

shaft, one end being attached to the lift C, while the other end projects outwardly and rests within a groove, *i*, in the clock-pillar L. A stop-pin, *m*, is attached to the front plate, M, and projects toward the end coil of the spiral spring, and serves as a stop to compress the spring in length, and thus force the rear pivotal bearing of the strike-shaft against the cam, and keep it in contact therewith.

It will be observed that the spiral spring K serves a double function. It operates to impart sufficient rotary action to the strike-shaft to cause the hammer N to strike the bell O with the desired force to sound the bell, and again it imparts a longitudinal motion to the strike-shaft and keeps it in direct contact with the adjusting-cam.

When only a single lift-pin, *a*, is attached to the collet on the center shaft, and thus the clock only adapted to strike once every hour, the extreme end of the lift C, which is made of thin steel, may be bent at an incline, as represented in Fig. 8, and enable the center shaft to be turned backward without disturbing the striking attachment. When constructed in the manner last described, the end of the pin *a* will strike the inclined portion *n* of the lift and force it laterally from the pathway of the pin, thus enabling the center shaft to be turned in either direction without injuring the striking attachment.

Fig. 3 represents the relative positions of adjusting-cam, sliding strike-shaft, lift C, and center shaft when the striking mechanism is thrown out of engagement with the time-movement. This is effected by turning the cam so that the lift may be forced laterally beyond the line of travel of the extreme end of pin *a*, whereby the several pins on the center shaft will not come in contact with the lift, and hence the striking mechanism will, under such conditions, remain inactive.

Fig. 4 represents the relative position of the several parts when the striking mechanism is adjusted to strike once every hour. In this case it will be observed that the cam is adjusted to force the sliding shaft longitudinally against the force of the spiral spring a sufficient distance to cause the lift C to be raised by the end of the hour lift-pin *a*.

Fig. 5 represents the position of the parts when the striking mechanism is adjusted to operate once every half-hour, the cam being turned a sufficient distance to move the lift C and cause it to be actuated by the pins *a b* during each revolution of the center shaft.

Fig. 6 shows the relative position of the several parts above noted when the strike mechanism is arranged to operate every fifteen minutes, the lift C being adjusted so as to be raised by the pins *a*, *b*, *c*, and *c'* during each revolution of the center shaft.

My improvement is adapted to be applied to any of the ordinary time clock-movements, either marine or pendulum clocks, and at a small initial cost. One important and valuable feature of the improvement is that it requires no additional space for its attachment, and may be embodied in a small clock which is provided with a tight-fitting case.

The adjustment of the striking mechanism is easily regulated, and there is little or no liability of disarranging any of the parts of the clock or striking attachment.

It is evident that slight changes may be made both in details of construction and arrangement of the several parts without departing from the spirit of my invention, and hence I do not limit myself to the exact construction shown and described—as, for instance, the lift-pins may be attached to the center shaft in various ways, as by drilling through the center shaft and fastening pins thereto, the ends of the pins being flattened or bent parallel with the shaft; or they may be formed like a cut pinion, with teeth of variable width; or they may be attached to a sliding collar or pinion adapted to be adjusted on the center shaft, and in such case the strike-shaft need not be adjusted longitudinally, as hereinbefore described. The pins may also be fastened to a wheel made to revolve once in every hour, two hours, or more, thus enabling the striking mechanism to be adjusted to strike every two hours, or at greater intervals of time.

The dial for setting the strike mechanism may be formed on the front of the case instead of on the back.

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

1. The combination, with the center shaft of a time clock-movement having a lift-pin combined therewith, of a lift attached to a longitudinally-adjustable strike-shaft, substantially as set forth.

2. The combination, with the center shaft of a time-movement having one or more lift-pins combined therewith, of a lift attached to a sliding strike-shaft and a cam for regulating the longitudinal adjustment of the latter, substantially as set forth.

3. The combination, with the center shaft of a time-movement, of a collet attached to the shaft, said collet having one or more lift-pins secured thereto, and a lift attached to longitudinally-adjustable strike-shaft, substantially as set forth.

4. The combination, with the center shaft of a time-movement provided with a collet having two lift-pins attached thereto diametrically opposite each other, of a lift attached to a longitudinally-adjustable strike-shaft, substantially as set forth.

5. The combination, with the center shaft of a time-movement having a collet attached thereto which is provided with four lift-pins located equidistant from each other, of a lift attached to a longitudinally-adjustable strike-shaft, substantially as set forth.

6. The combination, with a strike-shaft provided with elongated pivots, of a face-cam

and a spring for retaining one of the strike-shaft pivots on said cam, substantially as set forth.

7. The combination, with a strike-shaft provided with elongated pivots, of a face-cam and a spiral spring surrounding the strike-shaft, and adapted to impart both longitudinal and rotary motion to the strike-shaft, substantially as set forth.

8. The combination, with a strike-shaft constructed with elongated pivots, and a spring for imparting both rotary and longitudinal movement to the same, of a face-cam adapted to serve as an end bearing for one of the pivots of the shaft, said cam having a pointer connected therewith, and an indicating-dial formed on the back of the clock-case, substantially as set forth.

9. The combination, with a cam for imparting longitudinal movement to a strike-shaft, of a pointer and indicating-dial, substantially as set forth.

10. The combination, with one or more lift-pins connected with the time mechanism of a clock-movement, of a striking-shaft, the parts adapted to be relatively adjusted so that the strike mechanism can be thrown either in or out of engagement with the time mechanism, substantially as set forth.

11. The combination, with the center shaft of a time clock-movement and lift-pins connected therewith, of a striking-shaft adapted to be adjusted relatively to said lift-pins to cause the strike mechanism to operate at any desired intervals of time, substantially as set forth.

12. The combination, with two or more lift-pins of varying lengths connected with and moved by the time mechanism of a clock-movement, of a striking-shaft, said parts adapted to be relatively adjusted so that the strike mechanism may be operated at different intervals of time, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 21st day of August, 1878.

HENRY W. PORTER.

Witnesses:

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DAN. A. MILLER.