2 Sheets—Sheet 1.

A. L. ATWOOD.

Lock-Work for Clocks.

No. 221,493. Patented Nov. 11, 1879.

Fig. 1.

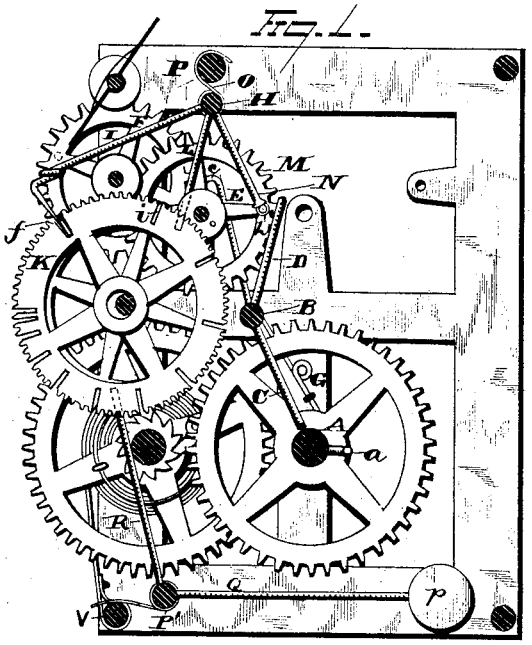


Fig. 2.

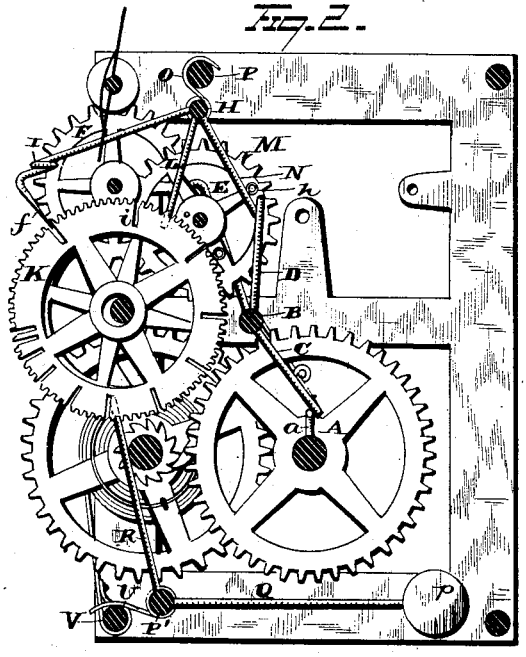
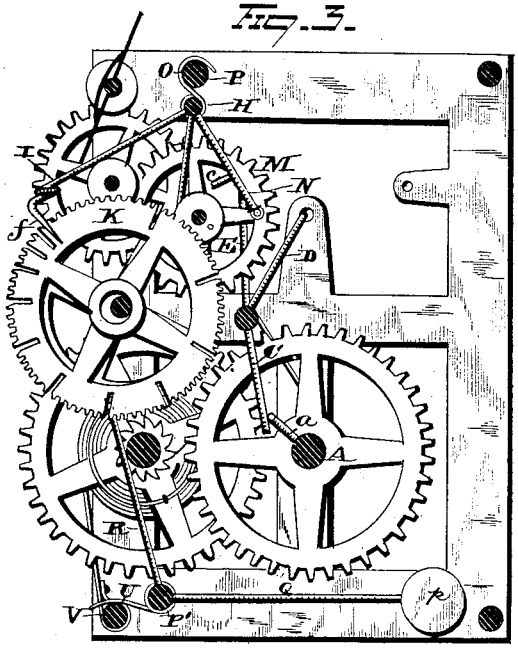


Fig. 3.



WITNESSES

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2 Sheets—Sheet 2.

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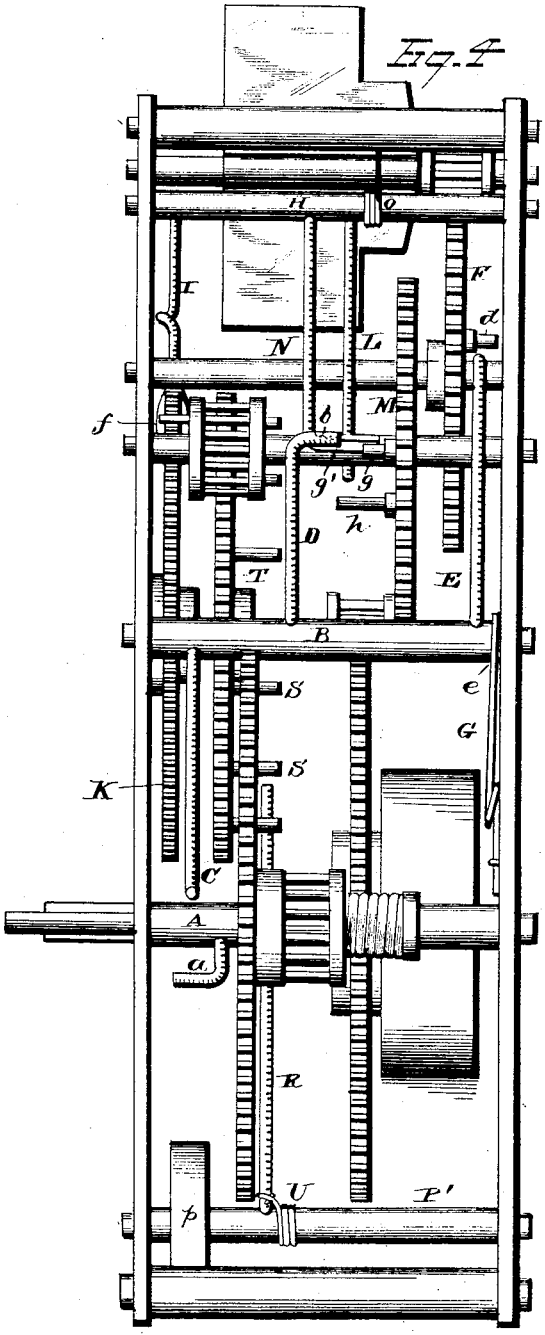

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UNITED STATES PATENT OFFICE.

ANSON L. ATWOOD, OF BRISTOL, CONNECTICUT, ASSIGNOR TO E. INGRAHAM & CO., OF SAME PLACE.

IMPROVEMENT IN LOCK-WORK FOR CLOCKS.

Specification forming part of Letters Patent No. **221,493**, dated November 11, 1879; application filed September 12, 1879.

To all whom it may concern:

Be it known that I, A. L. ATWOOD, of Bristol, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Lock-Work for 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 lock-work for clocks.

The object of the invention is to provide lock-work of such construction and arrangement relative to the strike-train of a clock-movement that the hands of the clock may be turned backward any desired distance without disturbing the striking mechanism of the clock, and, further, to construct the different parts in such a manner that by turning the minute-hand backward a part of a revolution and then forward a part of a revolution the striking mechanism will be set in operation, and thereby admit of the setting of the striking mechanism by the aid of the minute-hand alone, and thus dispense with the push-wire ordinarily employed for such purpose.

My invention consists in certain details of construction and arrangement of parts in the lock-work of clocks, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of the striking mechanism of a clock, the front frame being removed to more clearly show the position of the parts, which latter are represented in their proper positions before the lift-hook has revolved a sufficient distance to actuate the lock-work. Fig. 2 is a similar view, showing the position of the parts when the lift-hook has raised the lift-arm and set the striking mechanism of the clock in motion. Fig. 3 is another view, showing the position of the parts when the lift is turned backwardly. Fig. 4 is an edge view of the clock-movement.

A represents the center shaft of an ordinary strike-clock movement, and *a* is a lift-hook rigidly secured to the center shaft in the usual manner. B is a rock-shaft, the tenoned ends of which have bearings in the front and back frames of the movement. To rock-shaft B is secured one end of the lift arm or rod C, the latter being of sufficient length that its lower and free end shall come in contact with the hook *a* when revolved in either direction. D is an arm secured to the rock-shaft B, near the central portion thereof, said arm projecting upwardly, and provided with a hook, *b*, at its upper end, which hook portion is parallel, or practically parallel, with the rock-shaft. To the rear end of the rock-shaft B is secured an arm, E, which projects upwardly, and is provided on its upper end with a hook, *c*, which engages with a pin or stud, *d*, secured to the face of the third wheel, F, of the train whenever the lock-work is actuated to set the strike mechanism in operation.

The rear end of rock-shaft B is cut away to form a flat or angular bearing, *e*, for the free end of a spring, G, the latter being secured at one end to the rear frame of the movement.

Spring G serves to hold the arms or rods D and E out of engagement with the wheels of the strike-train until the proper time arrives for setting the striking mechanism in operation.

H is a rock-shaft located between the upper portion of the frames of the movement, and is provided with a count-hook, I, the flattened and hooked end *f* of which engages with the ordinary count-rim K in the usual and well-known manner. Rock-shaft H is also provided with a depending arm, L, with which a stud or pin, *g*, attached to the front face of the second wheel, M, engages at every revolution of the latter, and operates to turn the rock-shaft sufficiently to lift the hook *f* of the count-hook from the notches in the count-rim K. Rock-shaft H is also provided with another depending arm or rod, N, upon the lower or free end of which is formed a flattened hook, *g'*, which engages with a stud or pin, *h*, attached to the front face of the second wheel, M, whenever the clock-striking mechanism has operated sufficiently to cause the count-hook to drop in one of the deep hour-notches *i* in the count-rim.

The lower end of the arm N projects slightly below the upper end of the arm D, for a purpose hereinafter described.

A fine wire spring, O, is attached to the rock-shaft H, and its free end to the pillar P, the spring tending to retain the count-hook in engagement with the count-rim.

P′ is a rock-shaft pivoted between the front and rear frames at their lower ends, and has a hammer-rod, Q, secured thereto, the outer end of which is provided with a hammer, *p*. Rock-shaft P′ is also provided with an arm, R, which projects upwardly and engages with the pins or studs S, attached to the rear face of the first wheel, T, said arm being held in contact with the studs by a spring, U, attached to the rock-shaft, and its outer end secured to the pillar V. Spring U is of sufficient strength to cause the hammer *p* to strike the bell with the required force.

Having described the construction and arrangement of the several parts of my improved lock-work, I will now describe its operation:

Assume that the striking-movement has just struck eleven, the different parts of the lock-work will then be in the position illustrated in Fig. 1 of the drawings. The count-hook, it will be observed, rests within the deep notch or slot in the count-rim corresponding to the eleventh hour, and the depending arm N is thrown toward the center of the clock-movement a sufficient distance to cause the stud *h* on the second wheel, M, to rest or abut against the flattened hook *g* of said arm. The arm D is moved to the right and out of contact with the lower end of arm N, and also the arm E is moved to the right and out of contact with the stud *d* on the third wheel, F. When the center shaft has been revolved by the time-train nearly a complete revolution, or through a revolution equivalent to fifty-five minutes, or thereabout, on the clock-dial, the lift-hook on the center-shaft strikes the depending arm C, moving it to the right, and thus imparting a part revolution to rock-shaft B. As the arm D is rigidly secured to the opposite side of rock-shaft B, said arm D is simultaneously moved to the left and impinges upon the lower end of arm N, moving the latter to the left and releasing its flattened hook from its engagement with the stud or pin *h* on the second wheel, M. The wheel M is then revolved by the train from the strike-spring until the pin or stud *d* on the third wheel, F, comes in contact with the hook on the end of arm E, the latter having been moved to the left simultaneously with the arm D. Hence the striking mechanism is now held from operation by means of the engagement of the hook on the arm E with the stud or pin on the third wheel, F. The center shaft continues to revolve until the minute-hand points to the figure 12 on the dial, and when the hand reaches this position the lower end of the arm C is released from the lift-hook and is instantly moved to the left through the medium of the spring G, acting on the flat bearing *e* formed on the rock-shaft B. At the same time the arms D and E are instantly moved to the right and out of engagement with the striking mechanism. The strike-train is thus allowed to run, and at every revolution of the second wheel, M, the stud or pin *g* attached thereto impinges against the arm L, moving it to the left, and raising the count-hook from the shallow notches in the count-rim, there being eleven in number, located between the deep hour-notches formed for striking the eleventh and twelfth hours. As the first wheel, T, revolves the pins S secured thereto actuate the arm R and hammer *p*. The strike-train continues to operate until the count-hook drops into the twelfth-hour notch in the count-rim, when the arm N will have moved a sufficient distance to the right to cause its flattened hook to engage with the pin or stud *g* on the second wheel, M, and thus stop the movement of the strike-train of wheels.

Now, it is often desirable to revolve the minute-hand to the left in order to set the clock. This operation can be performed with my improved lock-work without disturbing or impairing the operation of the lock-work. When the hand is turned backwardly, or to the left, the lift-hook on the center shaft moves the lower end of the arm or rod C to the left, as illustrated in Fig. 3 of the drawings, and thus operates to move the arms D and E to the right, or away from the remaining parts of the lock-work, and hence it is that the hands may be freely turned backward, or to the left, without affecting or impairing the striking mechanism of a clock.

Another important and valuable feature of my improved lock-work attachment is that the striking mechanism may be operated by simply manipulating the minute-hand of the clock, and thus dispense with the push-wire which is ordinarily employed for such purpose. In small clocks with metal cases, and in marine clocks, it is desirable to dispense with the ordinary push-wire, and by my improvement this is done, and the clock-striking may be set by simply turning the minute-hand, as will be understood from the following: Suppose that the hands of the clock have reached the third hour of the day, and the strike-movement of the clock should strike but twice. In such case the minute-hand may be turned backwardly until the lower end of the lift-arm C drops from the lift, and then turn the minute-hand forward, or to the right, until it points to the figure 12 on the dial, when the striking mechanism will strike three times, as required. Or, again, suppose that at three o'clock the strike-movement should strike four different times. It is simply necessary to oscillate the minute-hand backward from the figure twelve (12) about a quarter-revolution and then forward again, and so continue the operation until the clock has been struck around to the third hour.

My improved lock-work attachment is sim-

ple in construction, of small initial cost, and is certain and durable in use.

It is evident that slight changes in the construction and arrangement may be resorted to without departing from the spirit of my invention, and hence I would have it understood that I do not limit myself to the exact construction and arrangement of parts shown and described; but,

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

1. The combination, with the lift-hook on the center shaft, of a rock-shaft provided with a lift arm or rod constructed and arranged to be moved to the right or left by the lift-hook, and an arm secured to said rock-shaft which will engage with a stud or pin on one of the wheels of the strike-train when the lift-arm is moved to the right, substantially as set forth.

2. The combination, with the strike-train and lock-work connected therewith, of a rock-shaft provided with an arm for releasing the lock-work and with another arm constructed and arranged to be moved in one direction by the lift-hook on the center shaft, and thereby actuate the lock-work during each revolution of the lift-hook, and to be moved in the opposite direction when the lift-hook is turned backward, and thus prevent interference with the lock-work when the hands are turned backwardly, substantially as set forth.

3. The combination, with the lift-hook on the center shaft and lock-work engaging with the strike-train, of a rock-shaft provided with an arm, D, for actuating the lock-work engaging with the strike-train and with another arm, C, formed with an unobstructed bearing for the lift-hook when moved in either direction, whereby the lift-hook when revolved to the right will cause the arm D to engage with said lock-work and when revolved to the left will cause the arm D to be moved away from said lock-work, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 2d day of September, 1879.

ANSON L. ATWOOD.

Witnesses:
C. S. TREADWAY,
C. D. DIEFFANY.