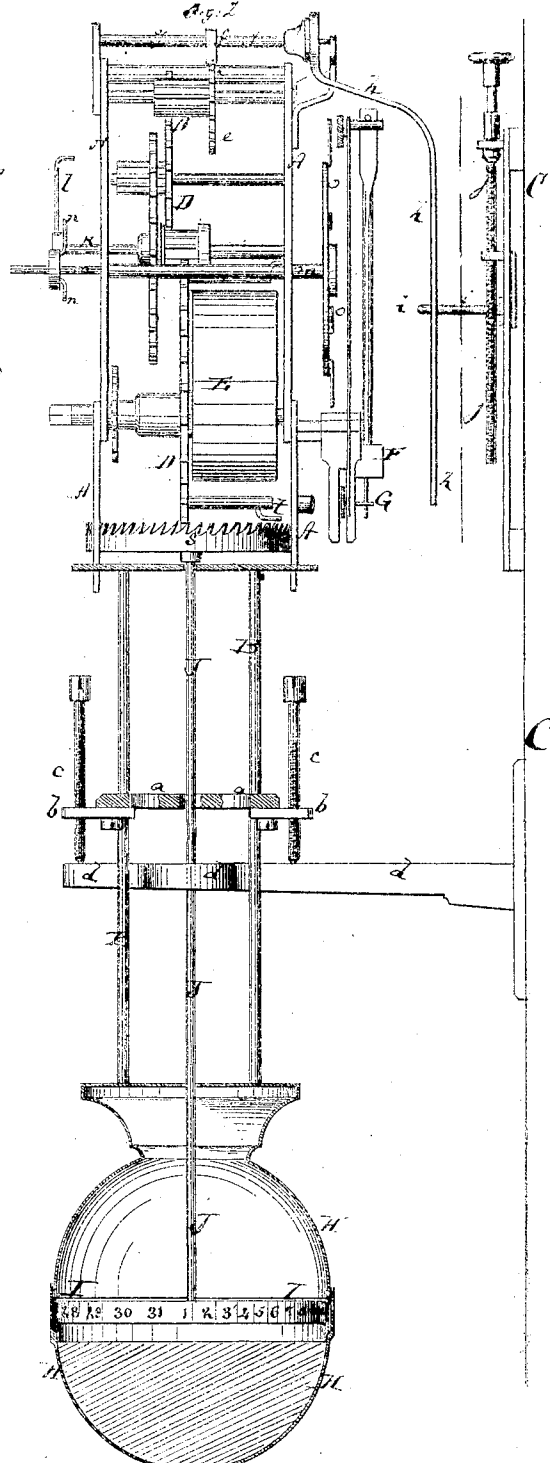
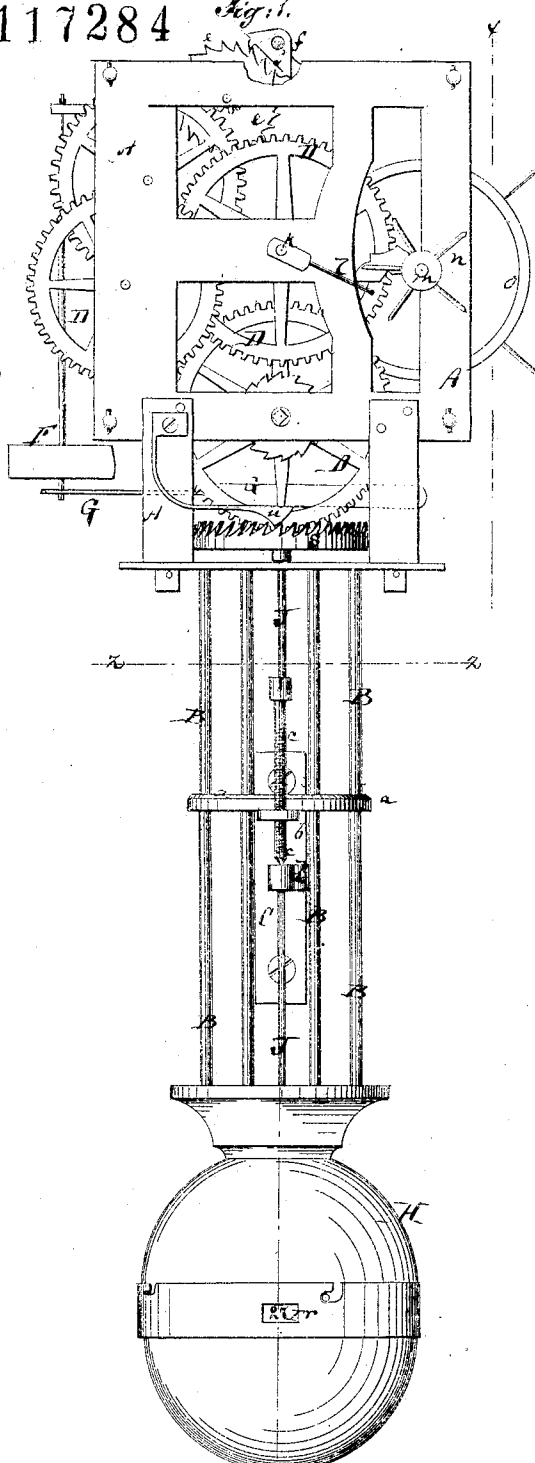


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Fig. 1.



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G. Hermann's Clock.

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Fig. 3.

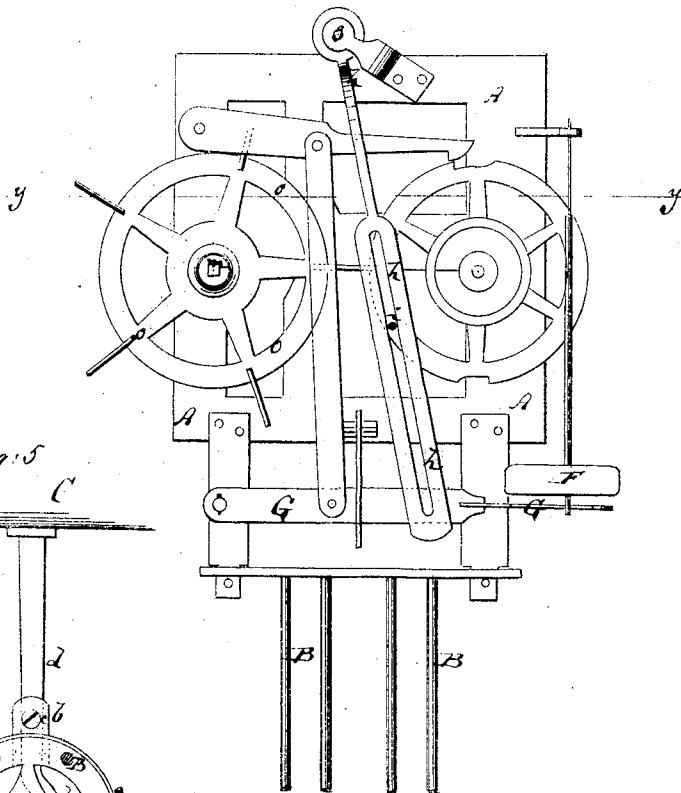


Fig. 5

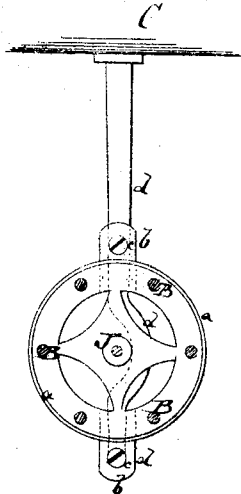


Fig. 4

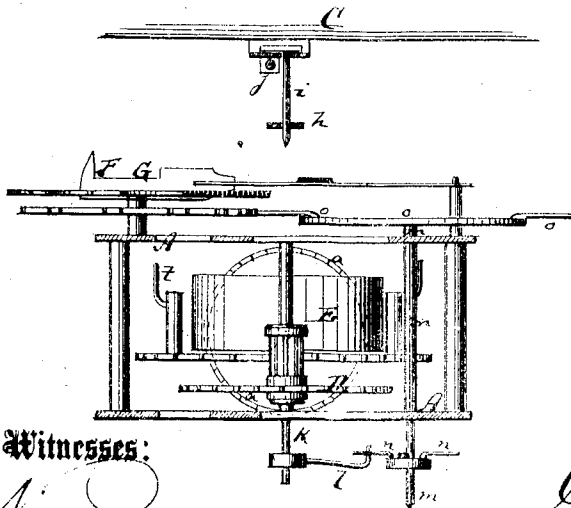
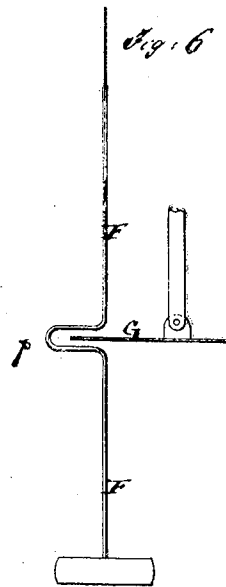


Fig. 6



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UNITED STATES PATENT OFFICE.

GEORGE HERRMANN, OF NEWPORT, RHODE ISLAND.

IMPROVEMENT IN SWINGING CLOCKS.

Specification forming part of Letters Patent No. 117,284, dated July 25, 1871.

To all whom it may concern:

Be it known that I, GEORGE HERRMANN, of Newport, in the county of Newport and State of Rhode Island, have invented a new and Improved Clock; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 represents a front view of my improved clock. Fig. 2 is a side view, partly in section, of the same, the plane of section being indicated by the line *x x*, Fig. 1. Fig. 3 is a back view of the upper works. Fig. 4 is a horizontal section of the same taken on the plane of the line *y y*, Fig. 3. Fig. 5 is a detail horizontal section of the pendulum, the plane section being indicated by the line *z z*, Fig. 1. Fig. 6 is a side view of a striking attachment of modified construction.

Similar letters of reference indicate corresponding parts.

This invention relates to a new clock, which is constructed so as to constitute its own pendulum, being so intimately connected with the same as to swing with it. The advantages derived from such an arrangement are, chiefly, greater exactness and reliability, and also a motive power for the striking attachment and all other mechanism connected with the clock, an additional spring not being required. My invention consists in improving clocks, as hereinafter fully described and subsequently pointed out in the claims.

A in the drawing represents the frame-work of my clock—that is to say, of the clock-work proper. This frame is, by a series of vertical rods, B B, or by a suitable standard, connected with a ball, H, or globe, which constitutes the pendulum. The standard B contains, at or near its middle, a transverse plate, *a*, which has projecting ears *b b* forward and backward, the said ears containing vertical pins *c c*. The lower ends of the pins *c* rest on a horizontal arm, *d*, which projects from a stationary frame or post, C. The ends of the pins *c* are pointed or rounded to form convenient pivots for the apparatus, which, together with the frame A, swings on the same. The pins *c* are provided with screw-threads, to be vertically adjustable, so as thereby to regulate the swing of the pendulum and the consequent time of the

clock. The ears *b* are pivoted to the plate *a*, so that they can be swung in or out of line to equalize the movement of the clock if the same should not be equally heavy on both sides. In the frame A is hung the appropriate train of wheels D D for transmitting motion from the mainspring E to the hands on the hour and minute-spindles. This train is provided with an escapement-wheel, *e*, of suitable construction; its rotation being arrested at proper intervals by a vibrating anchor, *f*. The latter is mounted upon a spindle, *g*, which has a downwardly-projecting arm, *h*. The arm *h* is slotted longitudinally, and through the slot fits a pin, *i*, which projects from the stationary post C. As the clock swings on its pivots *c* and the mainspring at the same time tends to revolve the train of wheels, the arm *h* will also be vibrated by such movement, the degree of swing varying with the height of the pin *i*. The latter is, therefore, made vertically adjustable by means of a screw, *j*, or equivalent device, and will thereby regulate the time of the clock. Instead of connecting the arm *h* with the stationary pin *i*, as stated, it may be formed into a second pendulum, swinging on the pivot *g*, opposite to the swing of the clock proper, in which case the pin *i* is dispensed with. To the hour-spindle *k* is secured a projecting arm, *l*, which serves to impart intermittent rotary motion to an arbor, *m*, which has projecting spurs *n n* for receiving the action of the arm *l*. The arbor *m* carries a wheel, *o*, by means of which it serves to regulate the striking attachment, using no separate motive power for the same. The hammer F, for the striking attachment, is pivoted to the frame A and swings with the same to strike a suitable bell or sound instrument. In such case the frame A is provided with a swinging fork, G, which is let down by the aforesaid mechanism connected with the wheel *o*. When the fork G is let down the hammer F will be free to swing on its own pivot, by virtue of the motion of the clock, and to strike the bell. When the fork is elevated it will catch the hammer and prevent it from swinging separately. The mechanism acted upon by the parts *m* and *o* serves to let the fork G down at the proper time and to raise it up again when the requisite number of strokes has been given. Instead of hanging the hammer F to the frame A, as in Figs. 1, 2, and 3, it may be pivoted to the post C, in which case it would have an indented or bent-in

part, *p*, Fig. 6. The fork *G* would then be a mere plate, which, when in the indented portion *p*, will not affect the position of the hammer, but, when raised or lowered, will strike said hammer the desired number of times and then be replaced to the part *p*. In either case it will be seen that no spring is required for operating the striking mechanism, which derives its power entirely from the vibrating clock. Within the ball or sphere *H* is arranged an inner ring or ball, *I*, which has its outer rim or face marked with figures. The ball *H* is provided with one aperture, *r*, in front, through which one of said figures can be seen. The ring *I* is secured to a vertical shaft, *J*, which extends up into the frame *A* and is so hung as to rotate easily on its axis. Its upper end carries a toothed wheel, *s*, which receives intermittent rotary motion from an arm or arms, *t*, of a wheel in the regular train. By being thus turned at intervals of twenty-four hours the fig-

ures displayed through the opening *r* will be properly changed to record the date. A pawl, *u*, is applied to the wheel *s* to lock the same in position.

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

1. The arm *l* on the hour-spindle, combined with the arms *n* on the arbor *m* for setting the striking apparatus, substantially as herein shown and described.

2. The adjustable fork or plate *G*, arranged on a vibrating clock, for the purpose of regulating the operation of the hammer *F*, as set forth.

3. The rotary date-disk *I*, arranged within the pendulum-ball of a clock and connected with the upper works, as specified.

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