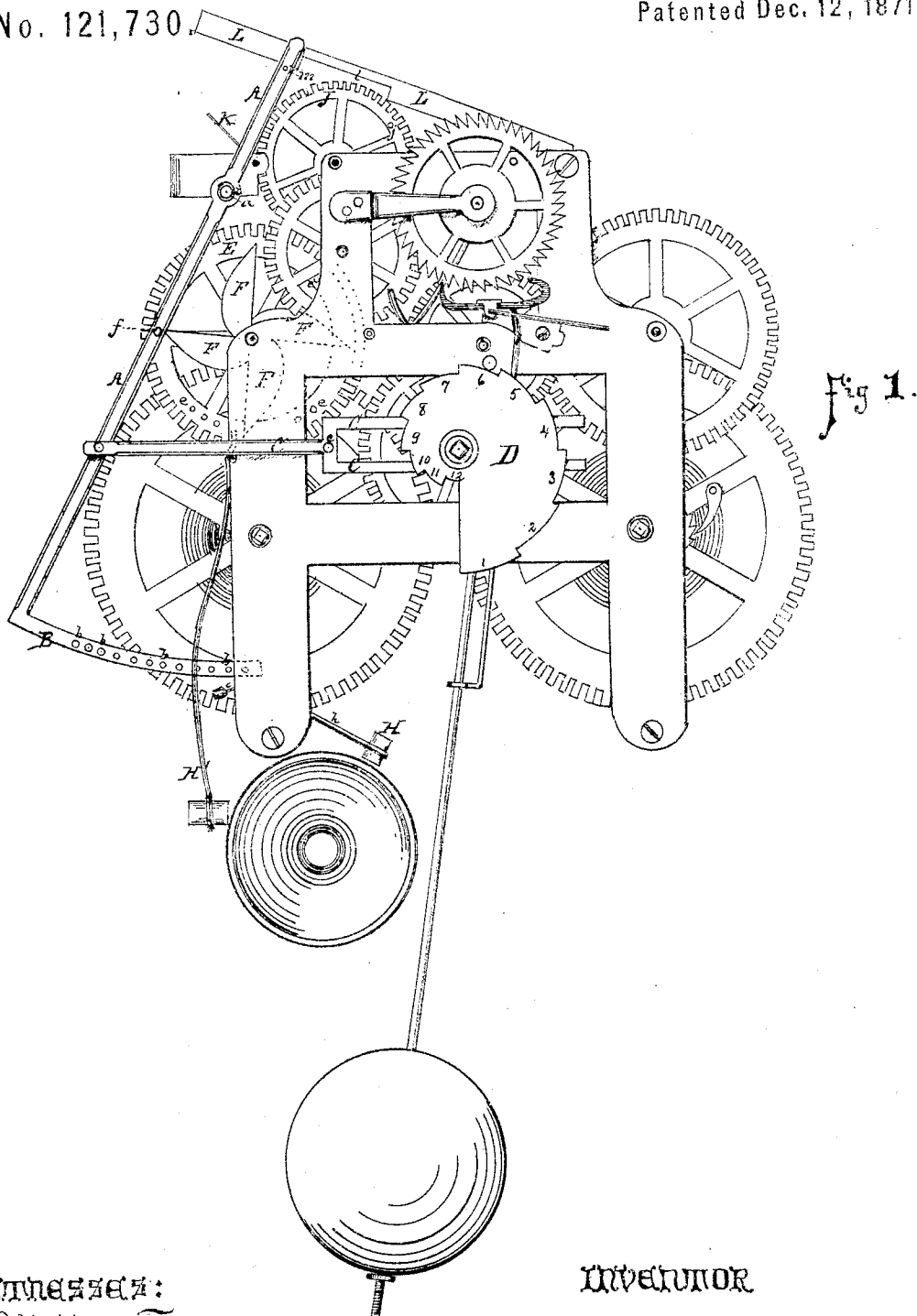


CARLTON W. ROBERTS
IMPT IN CLOCKS.

2 Sheets--Sheet 1.

No. 121,730.

Patented Dec. 12, 1871.



WITNESSES:

J. M. Munday
J. B. Munday

INVENTOR

Carlton W. Roberts

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Impt in Clocks.

2 Sheets--Sheet 2.

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Fig 2.

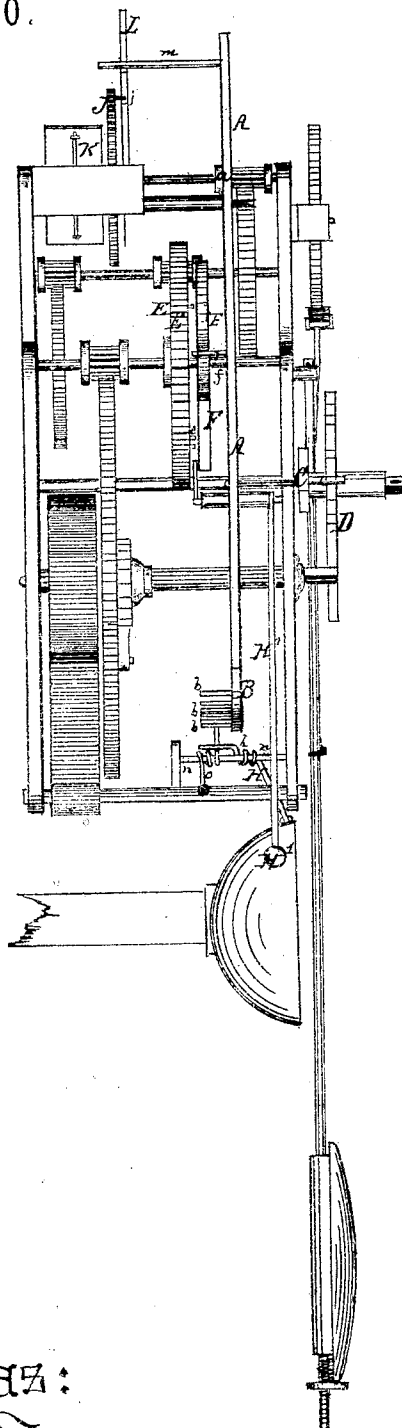
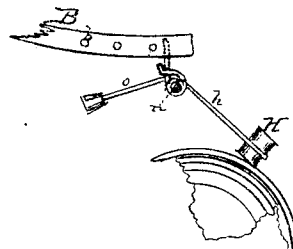


Fig 3.



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UNITED STATES PATENT OFFICE.

CARLTON W. ROBERTS, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN THE STRIKING MECHANISM OF CLOCKS.

Specification forming part of Letters Patent No. 121,730, dated December 12, 1871; antedated December 2, 1871.

To all whom it may concern:

Be it known that I, CARLTON W. ROBERTS, of Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Automatic Repeating Clocks; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to accompanying drawing, which, together with the letters and figures marked thereon, forms part of this specification, and in which—

Figure 1 is a front view of a clock embodying my invention. Fig. 2 is a side view of same, looking from the right; and Fig. 3 is a view of a portion of the arc for operating the hour-bell hammer, showing the arrangement of the tripping device.

To enable those skilled in the art to make and use my invention, I will proceed to describe the same with particularity, making use in so doing of the aforesaid drawing.

A is a lever, pivoted at *a* to the clock-frame, and carrying, at the lower extremity of its longer arm, an arc or secant, B, which conforms in outline to a portion of an imaginary circle of which the long arm is a radius. This arc is provided with twelve laterally-projecting pins, *b*, which are arranged to engage and operate a bell-hammer, H, when the lever A is swung upon its pivot, so that when the said lever is started from a perpendicular position and swung out to the full extent of the arc the pins will cause the hammer to strike twelve. A slide-bar, C, is connected to the long arm of this lever, and is fitted with a projecting pin, *c*, which strikes against one of the faces of the spiral cam or snail-wheel D. This cam is carried upon the hour-hand shaft and revolves once in twelve hours, and as there are twelve steps or faces in the spiral a new one is presented each hour. When the cam is in position so that the pin *c* will strike against the step nearest the center, the lever A will be allowed to drop to a perpendicular position and all the pins will engage the hammer, and as the faces of the cam are successively presented the arc will be allowed to return in a less and less degree toward the perpendicular, so that as each face is presented a different hour is struck. The shaft of the wheel E, which is one of the ordinary striking side-train wheels usually employed in clocks, is fitted in my invention with a quadruple or four-leaved cam, F, which engages a pin, *f*, upon the long arm of the lever A, and by the action of its curved sur-

faces lifts the said lever four times at each revolution of the wheel E, causing it to strike at each time the hour in the manner above described, and releasing it to fall back each time. The wheel E is furnished with pins *e*, projecting laterally from its rim. These pins are arranged in groups at points about said wheel forty-five degrees apart, excepting that at one point there is no pin, this being the even hour; the remaining points have, respectively, one, two, and three pins, for the intervening quarters of the hour. These pins engage a second bell-hammer, H', and cause it to strike the quarter each time the cams F cause the lever A and its arc to operate the hammer H to strike the hour; the stroke of the quarter precedes that of the hour by a slight interval of time. The wheel J, which is the ultimate or last wheel of the striking side-train, and which revolves the fly K, is furnished with a stop-pin, *j*, which rests against the notch *l* in the stop-bar L when said bar is down, which is its normal position. A pin, *m*, upon the short arm of the lever A rests also in this notch, at the outer end thereof.

Now the operation is as follows: As the time-side of the clock moves on in its regular course, the central or hand-shaft, by means of four pins, actuates a lever of wire, such as is usually employed, to raise the bar L and free the wheel J, thus releasing the striking-train. The lever A immediately drops from the point of one of the cams F toward a perpendicular position, which it is allowed to assume in a greater or less degree, according to the hour and the position of the snail D. The succeeding cam F now engages the said lever by the pin *f* and lifts it out, causing it to strike the hour; but previous to this, and during the passage from one of the cams F to the next, the pins *e* upon the wheel E have caused the hammer H' to strike the quarter. When the stroke of the hour is concluded, or, in other words, when the lever A is swung out to its full extent, the bar L drops the notch *l* upon the pin *m*, and thus falling in the way of the pin *j* upon the wheel J arrests the motion of the entire striking-train until another quarter has elapsed, when the operation is again repeated. It will thus be seen that the wheel E and the four-leaved cam F revolve once in each hour, and that the hour and quarter are struck each quarter of an hour. The hammer H, which strikes the hour, has its handle *h* pivoted to a small shaft or rod, *n*, to which is also pivoted

a small weighted lever, *o*, of a bell-crank shape, the short arm of which stands vertically above the shaft *n* and engages the pins *b* of the arc B as they pass in either direction. The hammer-handle or lever *h* has its short arm curved around behind the short arm of the lever *o*, so that when the arc B is raised outward and the pins *b* engage the short arm of the lever *o* the hammer will be raised by each pin and drops back striking the bell; but when the arc moves in the opposite direction the weighted lever *o* will alone be operated, acting simply as a ratchet. This construction and arrangement will be more clearly understood, perhaps, by reference to Figs. 2 and 3 of the drawing, which clearly exhibit the same.

It will be seen that, in a clock made after this invention, the hour will always be struck correctly, no matter how much the time-side may be set ahead by turning the hands, because, when the hands are turned, the snail D is also turned to accord therewith. This is a great advantage over the ordinary striking arrangement of clocks, as in such, when the hands are moved forward, the clock inevitably strikes wrong, unless the strik-

ing side is also forwarded, or, in other words, "struck around" by means of a twitch-wire or other like contrivance.

Having thus fully described the construction and operation of my invention, what I claim, and desire to secure by Letters Patent, is—

1. The wheel E of the striking movement, arranged to revolve intermittently once each hour, and provided with quarter pins *e*, in combination with the bell-hammer H', substantially as and for the purpose specified.

2. The combination of the stop-bar L, wheel J, and lever A, substantially as and for the purpose specified.

3. The combination of the quarter-striking wheel E, four-leaved cam F, and lever A, furnished with the arc B and pin *b*, arranged to strike the hour at each quarter, substantially as specified.

CARLTON W. ROBERTS.

Witnesses:

J. W. MUNDAY,
F. B. MUNDAY.

(36)