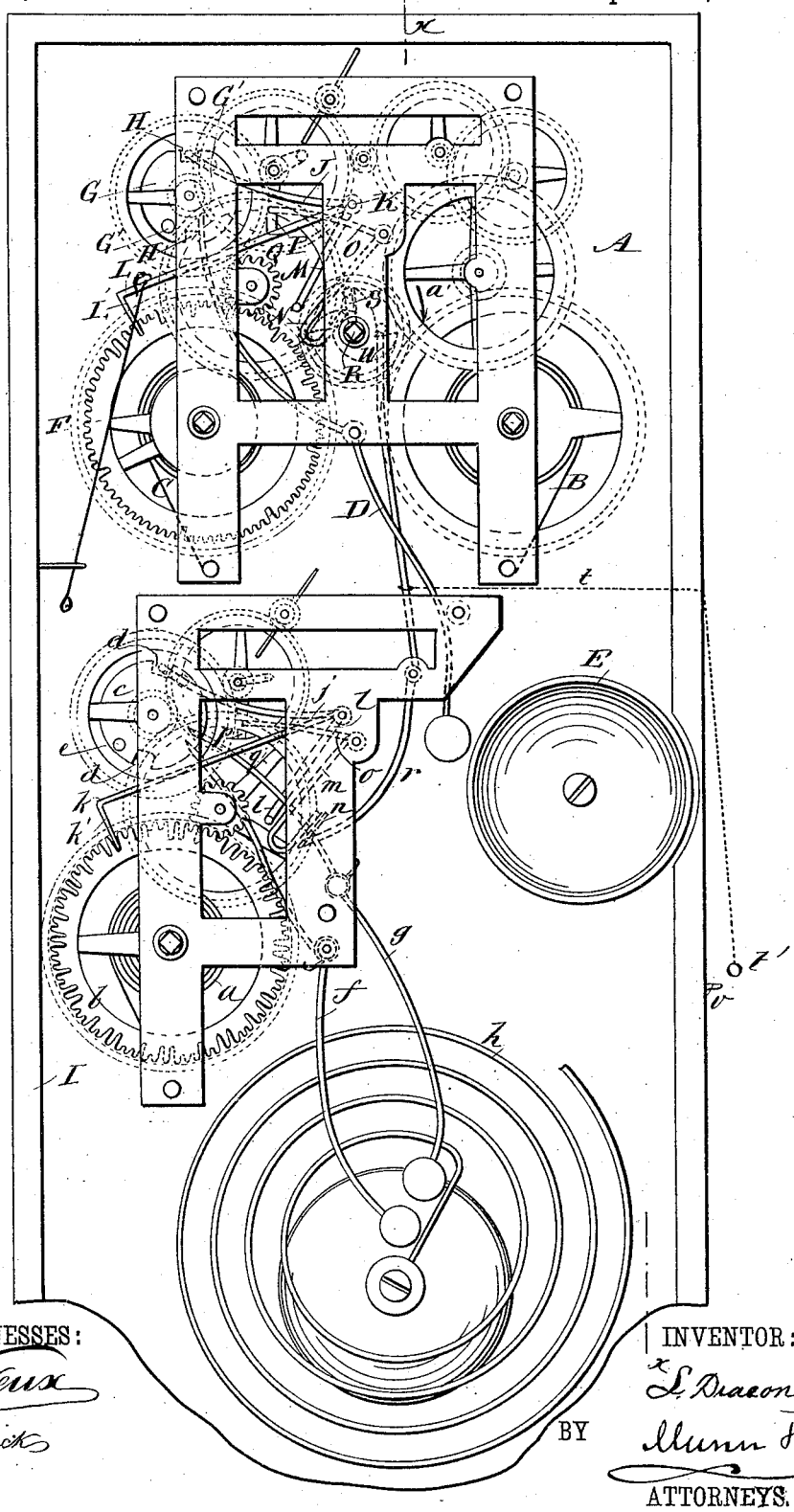
(Model.) 2 Sheets—Sheet 1.

L. DIACON.

CLOCK STRIKING MECHANISM.

No. 305,903. Patented Sept. 30, 1884.

Fig. 1



WITNESSES:

C. Neveux

C. Sedgwick

INVENTOR:

L. Diacon

BY Munn & Co

ATTORNEYS.

(Model.) 2 Sheets—Sheet 2.

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No. 305,903. Patented Sept. 30, 1884.

Fig. 2

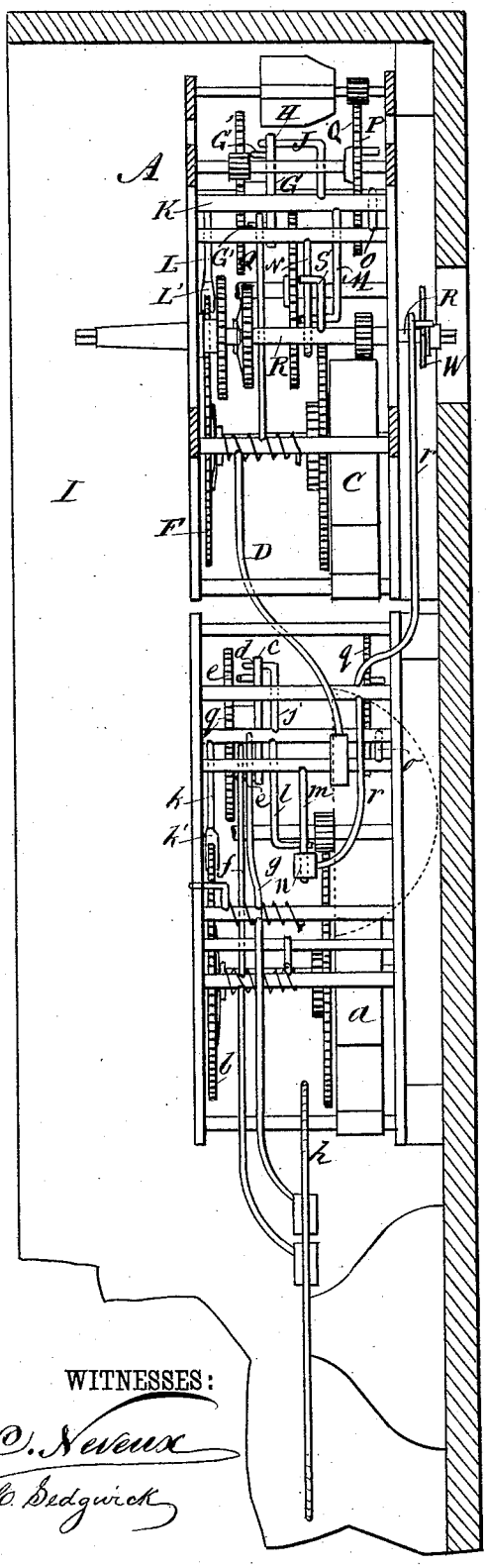


Fig. 3

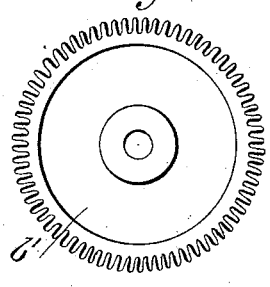
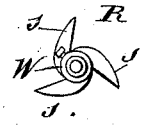


Fig. 4

Fig. 5

Fig. 6



WITNESSES:

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INVENTOR:

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UNITED STATES PATENT OFFICE.

LUCIEN DIACON, OF CHASKA, MINNESOTA.

CLOCK-STRIKING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 305,903, dated September 30, 1884.

Application filed April 4, 1884. (Model.)

To all whom it may concern:

Be it known that I, LUCIEN DIACON, of Chaska, in the county of Carver and State of Minnesota, have invented a new and Improved Clock, of which the following is a full, clear, and exact description.

This invention relates to certain new and useful improvements in that class of clocks which are constructed to strike the hour and subdivisions of the hour, such as all the quarter and half hours, or only the half-hours, or every twenty minutes; and the object of the invention is to simplify the construction of the clock, and thereby reduce the cost and the liability of its becoming disarranged.

The invention consists of the combinations of parts and their construction, substantially as hereinafter fully set forth and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a face view of a clock mechanism provided with my improvements for striking the hours and subdivisions of the hours. Fig. 2 is a cross-sectional elevation of the same on the line *x x*, Fig. 1. Fig. 3 is a face view of the toothed wheel that is used in case the clock is to strike only the half-hours. Fig. 4 is a face view of the cam used for striking the half-hours. Fig. 5 is a face view of the cam used for striking the quarter, half, and three-quarter hours. Fig. 6 is a face view of the cam used for striking the twenty minutes.

The clock-work mechanism is of the usual construction, and is provided with a spring, B, and gearing for operating the hands, and a spring, C, and gearing for operating the hammer-lever D, which strikes the hours on the gong E. The spring C acts on a wheel, F—such as is generally used in striking-clocks—the said wheel being provided in its rim with teeth of unequal depths, the small deep teeth being separated successively by one, two, three, four, or more small teeth, so as to successively strike the number of the hours, all in the usual manner.

By suitable gearing a disk, G, is revolved by the spring C, which disk is provided with pins G′, adapted to strike on the upper end of the hammer-lever D, thus causing the corresponding hammer to strike the gong E. The disk G is provided with notches H, into which the bent end of an arm, J, pivoted at K, is adapted to pass for locking the disk in place. An arm, L, is made integral with the inner end of the arm J, and is provided at its free end with a downwardly-projecting prong, L′, adapted to pass into the notches of the wheel F. Another arm, M, is also made integral with or is connected with the inner ends of the arms J and L, and is adapted to be acted upon by a lever or arm, N, having its lower end bent, as shown, which arm N is suitably pivoted, and is connected with or made integral with an arm, O, the free end of which is provided with a bent part adapted to pass into a notch, P, of a disk, Q, and which acts upon the arm J to lift the tooth or laterally-projecting portion of said arm out of the coincident or engaging notch H of the disk G.

From the minute-hand arbor R an arm, S, projects, the free end of which is adapted to act on the lower bent part of the arm N.

In addition to the above-described springs, I have provided a spring, *a*, which acts on a toothed wheel, *b*. The spring *a*, by means of suitable gearing, operates a disk, *c*, provided with two opposite notches, *d*, and with two studs, *e*, adapted to act on the ends of hammer-levers *f* and *g*, which act on a coiled spring, *h*, or on a bell. A pivoted arm, *j*, is provided at its free end with a bent part, adapted to pass into the notches *d* of the disk *c*, and is united with or made integral with an arm, *k*, having a downwardly-projecting prong, *k′*, at its free end, which prong *k′* is adapted to pass between the teeth of the wheel *b*. The said arms *j* and *k* are united with or made integral with an arm, *l*, the free end of which is acted upon by an arm, *m*, having its lower end bent, and which arm *m* is connected or made integral with an arm, *o*, the free end of which is provided with a bent part adapted to pass into a notch, *p*, in a disk, *q*.

Adjoining the bent end of the lever *m* a plate, *n*, is held, which is secured on the lower end of a lever, *r*, suitably pivoted, and extending up to the minute-hand arbor R, the upper end of which lever *r* is bent rectangularly. On the rear end of the minute-hand arbor R a cam-wheel, W, is mounted, which is either

provided with a single tooth or cam, s', or with three teeth or cams, s' s^2 s^3, or with three cams or teeth, s s s.

If the clock is to strike the half-hours only, in addition to the hours, a single cam or tooth, s', is mounted on the arbor R; if the clock is to strike the quarter and half hours, the wheel W, provided with the cams or teeth s' s^2 s^3, (shown in Fig. 5,) is used; and if the clock is to strike every twenty minutes, the wheel W, provided with three cams or teeth, s, is used. The cams or teeth s of the wheel W (shown in Fig. 6) are placed equidistant, as the clock is to strike every third of an hour; but if the clock is to strike the quarter, half, and three-quarters hours the teeth s' s^2 s^3 must be arranged as shown in Fig. 5—that is, the ends of the teeth s' and s^3 are diametrically opposite and are separated half a circle from each other—and the end of the tooth s^2 is separated a quarter-circle from each of the teeth s' and s^3—that is, after the tooth s^3 has acted on the upper end of the lever r the minute-hand arbor must make half a revolution before one of the teeth of the wheel W again acts on the upper end of the lever r. After the tooth s' has acted upon the upper end of the lever r the minute-hand arbor makes a quarter-revolution; then the tooth s^2 acts on the upper end of the lever r, the minute-hand arbor makes another quarter-revolution, and then the tooth s^3 acts on the upper end of the lever r.

The wheel b is provided with notches of different depths in its rim, which notches are arranged in the following manner: Two deep notches are arranged together, then one notch of less depth is arranged between two deep notches, then two notches of less depth are arranged between two deep notches, then two deep notches are arranged adjoining each other, and so on, so that the prong k' on the end of the lever will pass into a deep notch to strike a quarter, into a shallow and a deep notch to strike the half, into two shallow notches and a deep notch to strike the three-quarters, and then into a deep notch.

A cord or wire, t, secured to the lever r above its pivot, passes through the side of the case, and is provided at its lower end with a ring or loop, t', adapted to be fastened on a pin, v, in the side of the casing.

The operation is as follows: The minute-hand arbor is revolved in the direction of the arrow a', and at the end of every hour the arm acting on the lower bent end of the lever N presses the same upward in the direction toward the left, thereby causing the said lever N to act on the lower end of the arm M, whereby the arms L and J are raised and the striking mechanism is released and acts on the hammer-lever D in the usual manner, causing the said hammer-lever to strike the number of hours on the gong E. When one of the cams or teeth of the cam-wheel W strikes the upper end of the lever r, the said upper end is moved toward the right and the lower end is moved toward the left, thus causing the plate n on the lower end of the said lever r to act on the arm m and move the same upward and toward the left, which arm m acts on the arm o, whereby the arms j and k are raised and the striking mechanism is released, the disk c revolves and its pins e strike the hammer-levers f and g, causing the hammers on the said levers to successively strike the spring h, thereby striking the quarters.

If it is desired to put the striking mechanism out of operation, the cord t is pulled down and its lower end is held by the pin v, thus preventing the lower end of the lever r from being pressed against the arm m, thus locking the corresponding striking mechanism. If the clock is to strike every half-hour, and a single cam-tooth, s', is arranged on the minute-hand arbor, it is evident that the hammers f and g will be operated only at the half-hour. If three teeth s are arranged equidistant on the minute-hand arbor R, the hammer-levers f g will be operated every twenty minutes, and if the teeth s' s^2 s^3 are arranged on the minute-hand arbor, as shown in Fig. 5, the hammer-levers f g will be operated at the first, second, and third quarters of the hour, but not at the full hour, as the fourth tooth is omitted.

The wheel b, constructed in the manner shown and described, is used in case the first, second, and third quarters, or every twenty minutes of the hour are to be sounded; but in case every half-hour is to be sounded the wheel b' (shown in Fig. 3) is used, the notches of which are uniform in width and depth, as the hammer-levers f g are to make but a single stroke at each subdivision that they indicate.

The shafts to which the hammer-levers are secured are surrounded by springs, or springs are arranged in any other suitable manner to act on the hammers to give them sufficient power to strike the gong or coiled wire.

My improvement can be put in any old clock at a trifling expense.

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

1. In a clock, the combination, with the mechanism for striking the subdivisions of the hour, of the connected pivoted arms j, k, and l, the pivoted arm m, the lever r, having the plate n at its lower end, and of a cam-disk mounted on the minute-hand arbor, and adapted to act on the lever r, substantially as herein shown and described.

2. In a clock, the minute-hand arbor having a stud and a cam-wheel, the connected arms J, L, and M, the notched disk and wheel of the striking mechanism, and the connected arms O and N, the arms O and N acting upon the arms J and M, respectively, in combination with the lever r, acted upon by the cam-wheel of the minute-hand arbor, and hav-

ing at its lower end a plate, *n*, the connected arms *m o*, the connected arms J, K, and *l*, and striking mechanism, substantially as and for the purpose set forth.

3. In a clock, the combination, with the mechanism for striking the subdivisions of the hour, of the minute-hand arbor having the cam-wheel W, provided with a number of teeth, two being disposed diametrically opposite each other and the other midway between the other two, the connected arms *j*, *k*, and *l*, and the lever having the plate *n* at its lower end, substantially as and for the purpose set forth.

LUCIEN DIACON.

Witnesses:
F. E. DU TOIT,
G. KRAYENBUHL.