

(No Model.)

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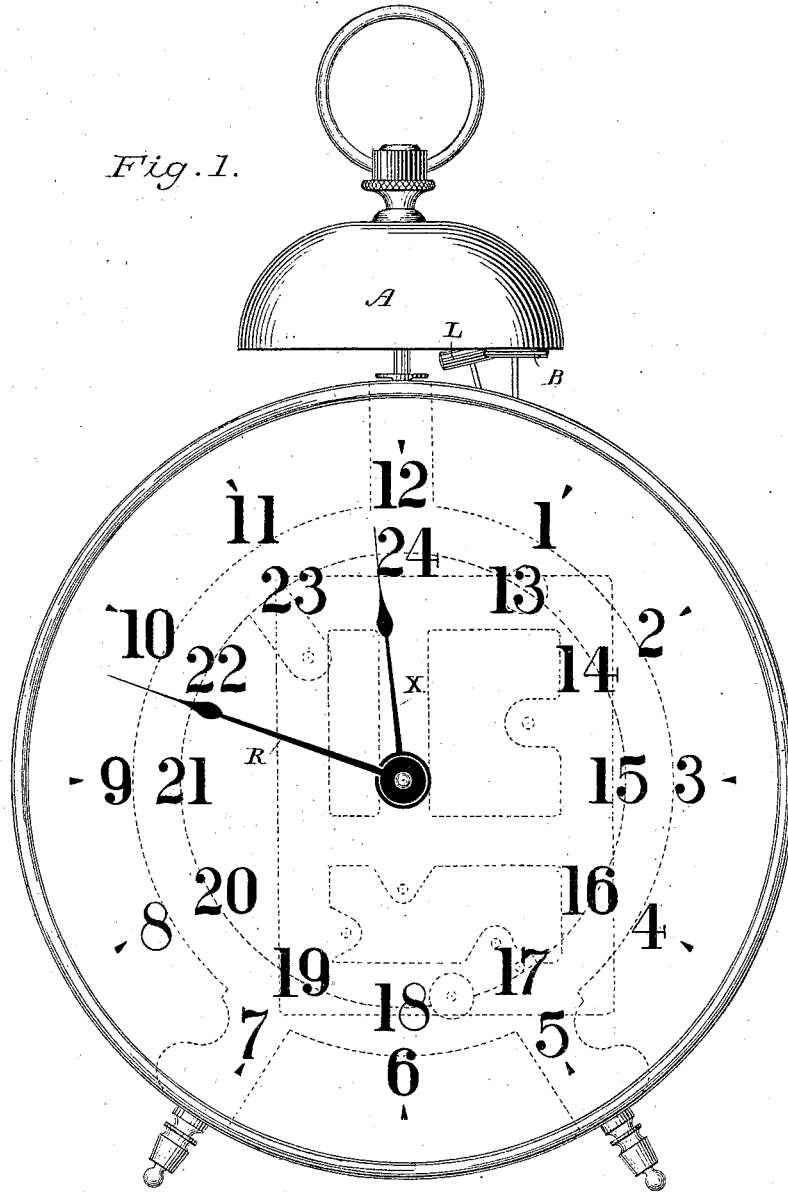
T. F. KEATING.

TWENTY-FOUR HOUR CLOCK STRIKING MECHANISM.

No. 302,497.

Patented July 22, 1884.

Fig. 1.



WITNESSES

Wm A. Slinkle
Chas. C. Newman

INVENTOR

Thomas F. Keating,

By his Attorneys

Baldwin, Hopkins & Peyton.

(No Model.)

3 Sheets—Sheet 2.

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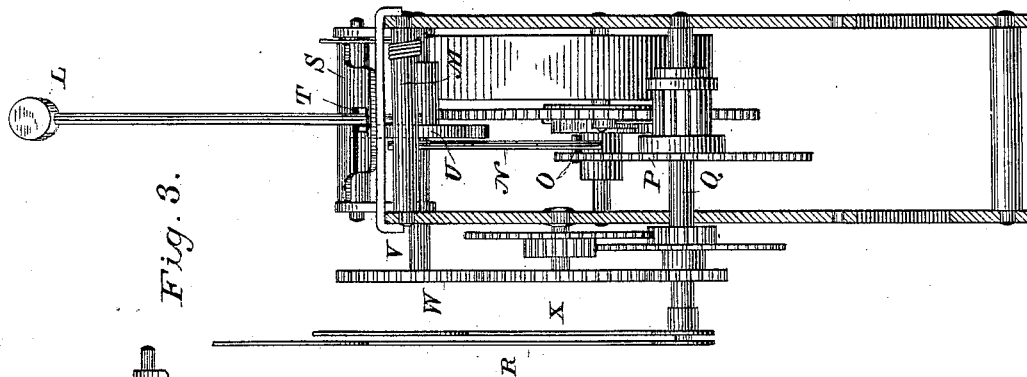
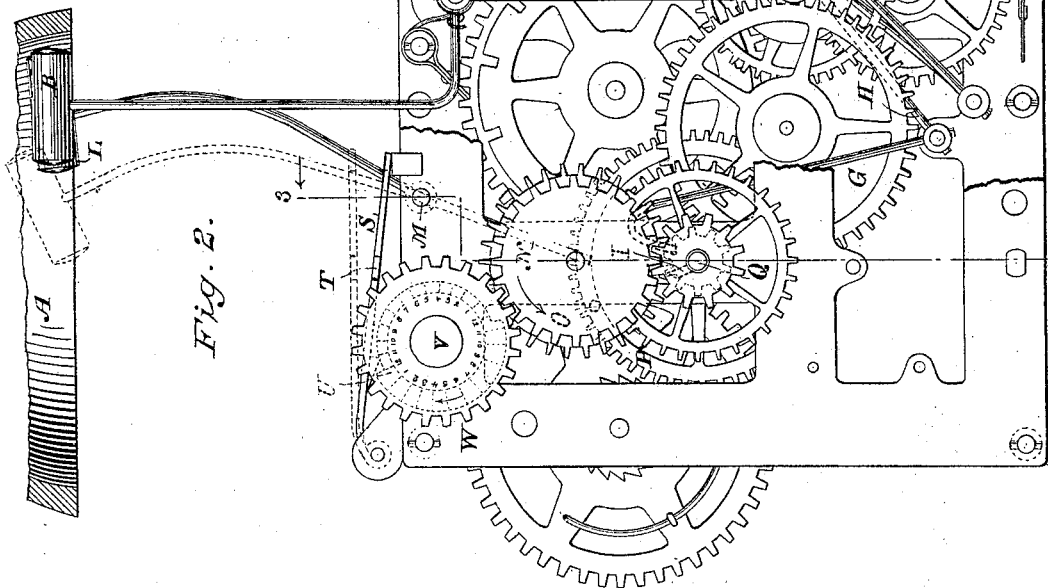
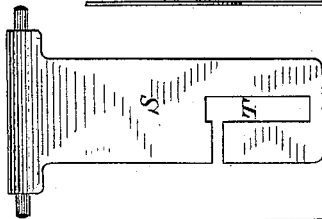


Fig. 4.



WITNESSES

Wm A. Sinkel
Al. C. Newman

INVENTOR

Thomas F. Keating,
By his Attorneys
Baldwin, Hopkins, & Peyton.

(No Model.)

3 Sheets—Sheet 3.

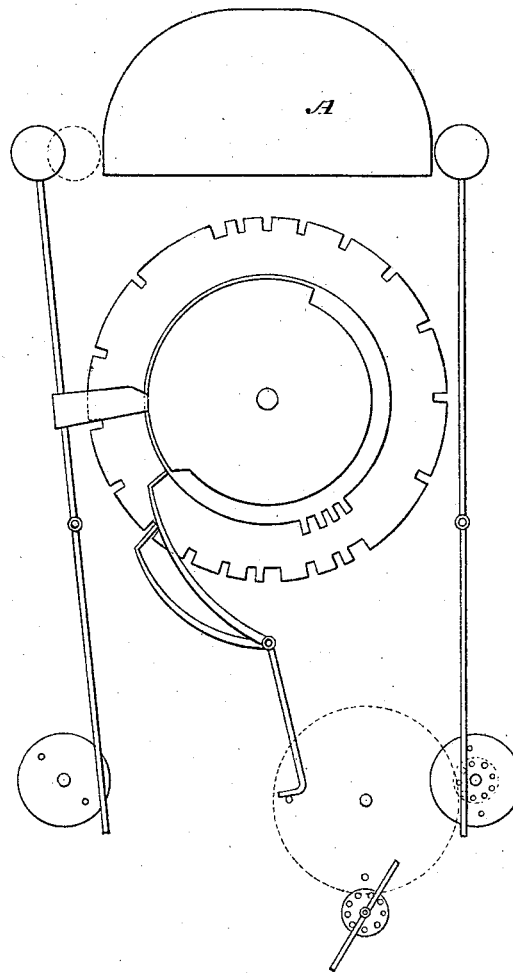
T. F. KEATING.

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Fig. 5.



WITNESSES

Wm A. Shink.

Chas. C. Newman.

INVENTOR

Thomas F. Keating.

By his Attorneys.

Alderson, Hopkins, & Peyton

UNITED STATES PATENT OFFICE.

THOMAS F. KEATING, OF NEW YORK, N. Y.

TWENTY-FOUR-HOUR-CLOCK STRIKING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 302,497, dated July 22, 1884.

Application filed April 4, 1884. (No model.)

To all whom it may concern:

Be it known that I, THOMAS F. KEATING, of New York city, in the county and State of New York, have invented certain new and useful Improvements in Clock Striking or Signaling Mechanism, of which the following is a specification, reference being had to the accompanying drawings.

My improvements are intended to be employed in connection with a clock-dial which has figures on it running from 1 to 24, which may be arranged in any preferred manner—as, for example, either in a single circle or in two circles, as illustrated in Figure 1 of the accompanying drawings, which shows a front elevation of an ordinary cheap clock with numbers on its dial from 1 to 24, and with a bell and striking mechanism.

I employ ordinary clock mechanism with ordinary striking apparatus, as shown in Figs. 2 and 3, which are respectively a front elevation and a central vertical section (on the line 3 3 of Fig. 2) of time-movements and bell signaling devices, having combined with them the additional mechanism I will now proceed to describe in detail, first premising that A indicates the ordinary bell; B, the ordinary spring hammer or striker; C, the ordinary notched striker-wheel; D, the spring-detent for entering the notches in the striker-wheel; E, the notched cam in which the spring-stop F works, and G and H the spring-arms which respectively contact with the cam I and detent D, to push the latter and the stop F out of their notches in the striker-wheel and cam E, so that the striker-spring K may cause the striking as usual. In connection with this ordinary time mechanism and striking mechanism I employ a second spring-hammer, L, pivoted at M and having an arm, N. This arm N projects downward into the path of a pin, O, upon a wheel, P, attached to a shaft, Q, of the long hand R. The adjustment is such that this pin will cause the hammer L to strike one slightly before the ordinary striking mechanism begins to work, so that there will be a short pause between the action of the two striking mechanisms—a little greater than that between the strokes of the ordinary striking mechanism, so as to be distinguishable. Now,

it is not desirable that this supplementary striking mechanism shall operate at every hour, but only at the hours after twelve o'clock m., for example, or after such an hour as may be preferred in practice. Accordingly I provide mechanism for throwing the supplementary striking mechanism out during certain hours of the twenty-four. This mechanism consists of a pivoted plate, S, (shown detached in Fig. 4,) having a slot, T, through which the hammer-arm L extends. Underneath this slotted plate is a cam, U, upon a shaft, V, carrying a spur-wheel, W, which gears with a train of wheels connected with the shaft of the short hand X, as illustrated in Fig. 3, in such a way as to raise the plate S and hold the hammer L, as illustrated by dotted lines in Fig. 2, so that it will not be struck by the pin O, or, if it is, so that its blow cannot reach the bell. This mechanism is so constructed and timed in its operations that the hammer L will be held out of the striking position until, say, for example, after twelve o'clock at noon, when it will be released and caused to strike one, as above indicated, a little in advance of the ordinary striking mechanism. This ordinary striking mechanism is arranged to strike the hours from one up to twelve twice during the twenty-four hours, and the supplemental striking mechanism is so arranged and timed with it as to strike one after twelve o'clock at noon, and immediately before the ordinary striking mechanism strikes each hour from one to twelve o'clock at night, inclusive, thus indicating by the signal that the striking is in the afternoon. After twelve o'clock at night the supplemental striking mechanism is thrown out of operation until one o'clock p. m., by the operation of the cam and slotted plate, as above described. This relative arrangement of the ordinary and supplemental striking mechanism is only shown for mere purposes of illustration. Instead of this, by the mere variation of mechanical means, (for example, as indicated by the diagram Fig. 5, in which the driving-springs, gears, &c., are not shown, but may be of ordinary kind,) without departing from the substantial structure and principle of combination of my improvement, a different method

of striking may be employed, as will be obvious to every person skilled in the manufacture of clocks. Thus, for example, one mechanism may be so arranged as to strike from one up to ten o'clock in the forenoon, while the supplemental striking mechanism is thrown out, and then, this latter mechanism coming into operation, the strike may be one by it, pause, then one by the other striking mechanism, for eleven o'clock; for twelve o'clock m., one, pause, two; for what has ordinarily been known as one o'clock p m., one, pause, three; then one, pause, four; one, pause, five; one, pause, six; one, pause, seven; one, pause, eight; one, pause, nine; one, pause, ten, until twenty o'clock, or what has ordinarily been known as eight o'clock in the evening. Then for the following hours, from twenty-one to twenty-four o'clock p. m., the strikes may be two, pause, one; two, pause, two; two, pause, three; and two, pause, four, by the employment of other similar mechanism suitable for the purpose, while the first-mentioned mechanism is thrown out for four hours.

My invention is not confined to any arbitrary order of striking; but its great object is to provide striking apparatus in a clock which shall avoid the use of a single apparatus to strike, successively, eleven, twelve, thirteen, &c., up to twenty-four times, in order to indicate to the ear the larger-numbered hours of the day, corresponding ordinarily, under old methods of reckoning time, to twelve o'clock midnight. Such an amount of striking would be disagreeable to the ear, and would be inconvenient to count, and the object of my invention is to obviate these objections, which may be done, as I have described, by different combinations of short strokes, or series of strokes, so that the striking may be accomplished quickly and with a minimum number of blows to indicate to the ear the correct time of day or night without annoyance or inconvenience.

In the drawings, Fig. 5, are represented, in mere outlines, two separate striking mechanisms, the striker-wheels both being upon the same shaft. This mechanism can be properly arranged and connected operatively with a time or driving mechanism, substantially such as shown in Fig. 2, so as to work substantially in the manner as indicated in that figure, one mechanism, however, striking slightly before the other does. One of the striker-wheels is spaced to strike from one to ten, then from one to ten again, and then from one to four, which completes the whole circuit of twenty-four hours. The other wheel is notched to strike one ten times, then two four times, and to be out of operation during the first ten strikes of the first mechanism.

When this mechanism is completely constructed and organized, as any one skilled in the art will readily know how to do, with a time mechanism to drive it, the operation will

be as follows: The clock being properly adjusted at one o'clock, it strikes one, and so on up to ten. When it reaches eleven, the proper cam will permit the other hammer to operate, and both will strike one, one strike preceding the other a second or two. At twelve o'clock one movement strikes one, the other two, as before. The mechanism continues to operate in that way until one and ten is reached, which is twenty o'clock. At the next hour the wheels permit the strikes two and one, two and two, two and three, and two and four, when both wheels will have made full revolutions, and the second day will then be begun as the first, with the parts in position to keep one strike inoperative while the other is striking from one to ten in the morning.

The trips for starting the strikes may be such as used in any ordinary clock, and of the kind, for example, as illustrated in Fig. 2, and should be so arranged that there will be an interval of a second or more between the strikes of the different striking mechanisms. This particular mechanism, however, like the one illustrated in Fig. 2 more fully, and described more in detail, is only one additional form of embodying my invention, which is capable of being embodied, as already stated, in a variety of forms.

Instead of striking upon the same bell, different bells having different tones may be employed, if desired. Instead of striking before, the supplemental striking mechanism might be timed to strike after the other; but that I should not prefer.

I do not claim, broadly, the system of signaling by the use of a blow or blows and a pause, and then another blow or blows and a pause, because I am aware that such a mode has been employed in connection with fire-alarms and elsewhere.

I am also aware that clock-dials have been numbered from one up to twenty-four, and I do not claim that.

What I claim as new is—

The combination, with an ordinary clock mechanism comprehending driving or time movements, dial, and hands, of two striking mechanisms set off by the operation of the same driving or time mechanism which sets off the ordinary striking mechanism, and timed to strike a blow or a short series of blows alternately, or one slightly before the other operates to strike, whereby the higher-numbered hours of the day may be signaled to the ear by a less number of strokes than are indicated by the numerals which designate them, substantially as set forth.

In testimony whereof I have hereunto subscribed my name this 27th day of March, A. D. 1884.

THOMAS F. KEATING.

Witnesses:

JOHN M. WILSON,
DAVID H. SMITH.