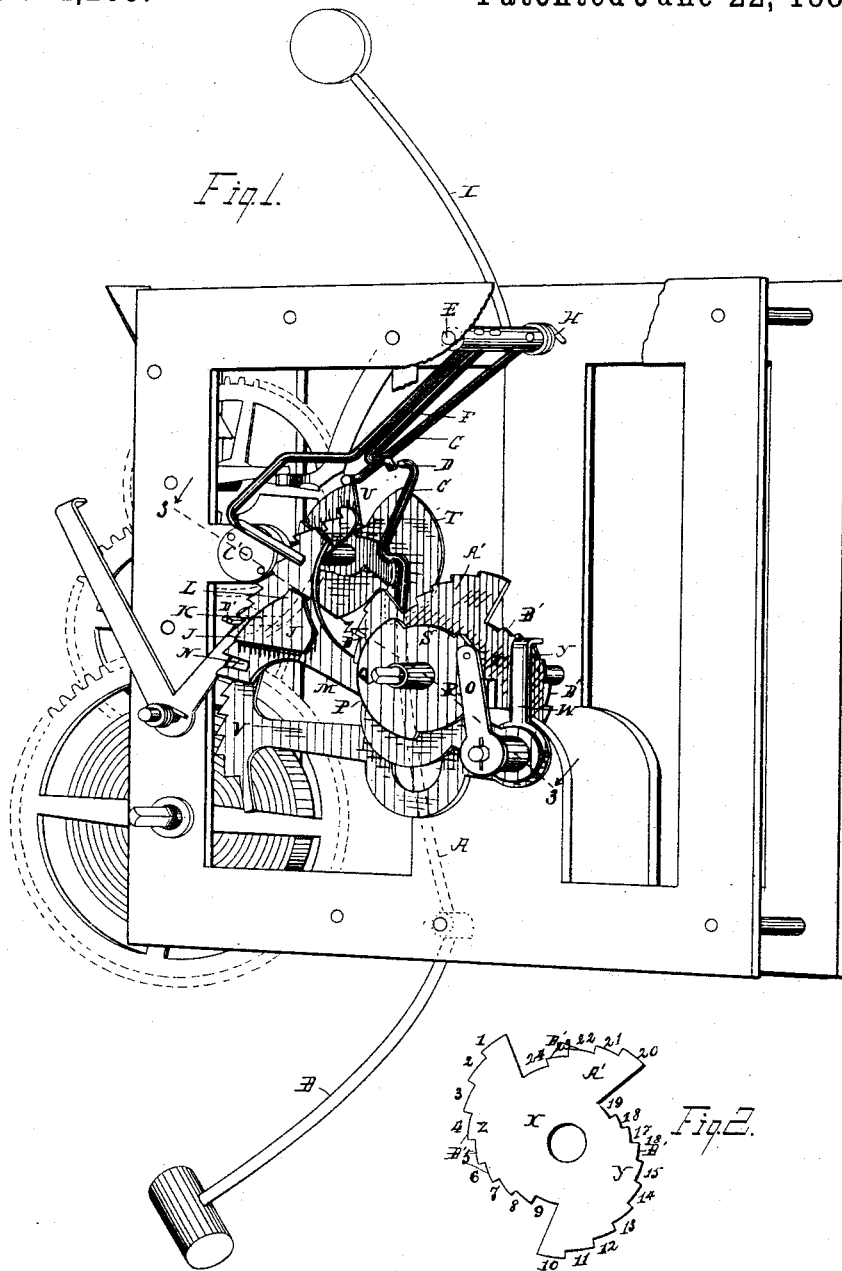


C. STAHLBERG.

TWENTY-FOUR HOUR STRIKING CLOCK.

No. 344,209.

Patented June 22, 1886.



WITNESSES:

E. H. Rogers.
C. L. Brown Jr.

INVENTOR

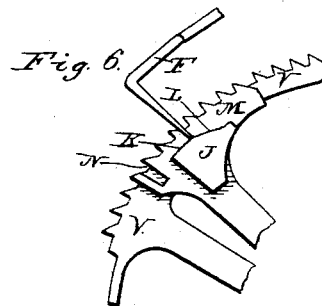
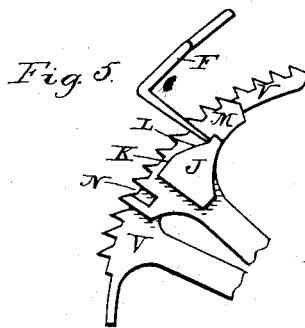
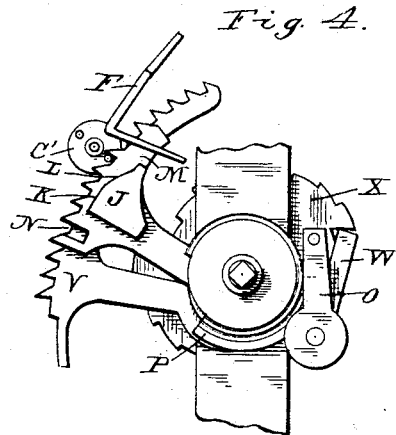
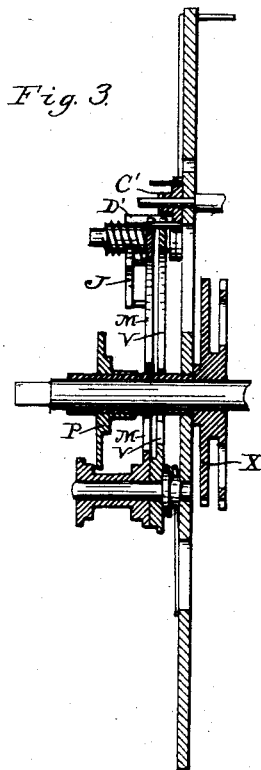
Charles Stahlberg
 BY *C. L. Brown Jr.*
 ATTORNEY

C. STAHLBERG.

TWENTY-FOUR HOUR STRIKING CLOCK.

No. 344,209.

Patented June 22, 1886.



Witnesses:

E. D. Smith
C. Taylor

Inventor:

Charles Stahlberg
by Henry L. Loomis
Att'y.

UNITED STATES PATENT OFFICE.

CHARLES STAHLBERG, OF WATERBURY, CONNECTICUT, ASSIGNOR TO THE
WATERBURY CLOCK COMPANY, OF SAME PLACE.

TWENTY-FOUR-HOUR STRIKING CLOCK.

SPECIFICATION forming part of Letters Patent No. 344,209, dated June 22, 1886.

Application filed April 24, 1885. Serial No. 163,976. (Model.)

To all whom it may concern:

Be it known that I, CHARLES STAHLBERG, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Striking Mechanisms for Twenty-Four-Hour Clocks; and I do declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to an improvement in striking mechanism for twenty-four-hour clocks, the object being to produce improved means for striking or signaling standard time digitately.

With this end in view my invention consists in means for temporarily holding the hammer against impact with its bell or gong without stopping the striking-train, and thus producing the interval required for digital signaling.

My invention further consists in certain details of construction, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of a clock embodying my invention. Fig. 2 is a detached view of the striking-cam. Fig. 3 is an enlarged section on line 3 3, Fig. 1, looking in the direction of the arrows adjacent to said line. Fig. 4 is an enlarged detail view of the interval and striking racks and adjacent parts, and Figs. 5 and 6 show said racks in different positions.

As herein shown, the lift-arm A of the hammer B is provided with an extension, C, which vibrates in the range of a hammer-detent, D, carried by an arbor, E, also carrying arms F and G, the said arbor and its attachments forming interval lock-work, which is thrown forward and downward, when released, by a spring, H, encircling the arbor. An auxiliary hammer, I, carried by the arbor, operates in conjunction with the hammer B in the production of a ding-dong effect. The said arm F is adapted to engage with an incline, J, provided at its edge with surfaces K and L, the surface L being eccentric to the center of movement of the said block or incline J, and the surface K concentric therewith. The incline J is located upon an interval-rack, M, having a

stop-notch, N, and controlled through its rack-arm O by an interval-cam, P, located in the time-train and arranged to be revolved once in twenty-four hours, and having its periphery divided into three steps, Q, R, and S, respectively representing the hours from 1 to 9, inclusive, from 10 to 19, inclusive, and from 20 through the remaining hours of the day. The said arm G is adapted to engage with a lift-cam, T, provided with two short slots, U, and located in the striking-train of the clock. The said interval rack M is operated in conjunction with a striking-rack, V, provided with an arm, W, engaging with a striking-cam, X, located in the time train and arranged to be revolved once in twenty-four hours, and having its periphery divided into three steps, Y, Z, and A', respectively corresponding to the steps Q, R, and S of the interval-cam, and provided for each of the several hours with teeth B', laid out to permit the striking-rack to drop, under the control of the rack-arm, a number of teeth corresponding to the number of strokes to be given for the several hours, with an additional tooth for the interval, where occurring. The said interval and striking racks are connected with the striking-train through a gathering-pallet, C', and a rack-detent, D', as shown.

Having fully described mechanism for carrying out my invention, I will proceed to set forth the operation of such mechanism. In warning for all of the hours, the interval and striking racks M and V respectively drop together, and subsequently and during striking they are raised together by the gathering-pallet C'. During the hours one to nine, inclusive, the interval lock-work is kept in retirement by the engagement of the arm F thereof with the incline J, which is prevented from being carried beyond the range of the said arm F when the interval-rack M is dropped in warning by the interval-cam P, with the step Q of which the arm O of the said interval-rack M engages during the period mentioned. The interval lock-work being retired during the hours referred to, they are signaled in the usual manner by simple strokes of the hammer B upon its bell or gong. In warning for the tenth hour, the interval-rack M is dropped farther

than during the preceding hours, owing to the falling of its arm O into the step R, and hence nearer the center of the interval-cam P, and the incline J is carried beyond the range of the arm F of the interval lock-work, which, however, is still supported in retirement by its arm G, which is at this time engaged with the periphery of the cam T, located in the striking-train. When the train is released for striking, the said cam T is rotated and one of the slots U is brought under the said arm G, permitting the interval lock-work to be thrown forward and downward by the spring H, whereby the auxiliary hammer I is operated to strike its bell or gong, and the hammer-detent D depressed below the extension C of the lift-arm A of the main hammer B, which follows the auxiliary hammer I in striking its bell or gong, and thus co-operates with it in the production of the ding-dong effect. Meanwhile, and during the performance referred to, the cam T has rotated and lifted the arm G to its periphery, whereby the interval lock-work is again elevated and the gathering-pallet C' has rotated and lifted the striking and interval racks M and V, respectively, and brought the surface L of the incline J under the arm F, so that when the succeeding slot in the cam T is brought into range with the arm G and the interval lock-work released it is caught by the engagement of the arm F with the surface L of the incline J, and the hammer-detent is brought into range with the extension C of the lift-arm A of the main hammer B, whereby the said extension engages with the detent D and holds the hammer B from striking without arresting the striking-train, which is stopped by the falling of the rack-detent D' into the stop-notch N of the interval-rack M, and the train is arrested with the main hammer B held by the hammer-detent D. Thus the signal for the tenth hour consists of a single ding-dong stroke. When the train warns for the eleventh hour, the cam T is rotated for carrying that one of its slots which was left under the arm G when the train was stopped beyond the range of such arm G, so that when the striking and interval racks M and V, respectively, are dropped the support of the interval lock-work is shifted from the incline J to the lifting-cam T, and the lock-work is sustained in the position in which it was left after signaling the tenth hour. Then, at the beginning of the striking-action, the lifting-cam T is rotated again to bring its succeeding slot within the range of the arm G, permitting the interval lock-work to be thrown forward and downward, whereby the extension C of the main hammer B is released, and the said hammer B follows the auxiliary hammer I in striking, and a ding-dong effect is produced. Meanwhile the interval-rack M has been raised by the gathering-pallet C', with the striking-rack V and the surface L of the incline J brought under the arm F, so that when the interval lock-work is again released for being thrown

forward it is caught by the engagement of the arm F with the surface L of the incline J, (see Fig. 5,) and the hammer-detent D is brought into the range of the extension C of the lift-arm of the main hammer B, whereby the said extension C engages with the detent D and holds the hammer B, without, however, arresting the striking-train, which meanwhile operates to lift the interval and striking racks M and V, respectively, and brings the surface K of the incline J under the arm F, so that when the interval lock-work is again released it is caught by the engagement of the arm F with the surface K of the said incline J, (see Fig. 6,) whereby the interval lock-work is retired by the supporting of the detent D above and without the range of the extension C of the lift-arm A of the main hammer B, which strikes alone. Thus it will be seen that the eleventh hour is signaled by a ding-dong stroke, followed by an interval succeeded by a single blow, and the hours to and including nineteen are signaled digitately and in the same way by a ding-dong stroke succeeded by an interval followed by two, three, four, five, six, seven, eight, and nine simple strokes. In warning for the twentieth hour the rack-arm O of the interval-rack M falls into the step S of the interval-cam P, and permits the rack M to drop and carry the incline J sufficiently far beyond the range of the arm F to permit two ding-dong strokes to be given before the gathering-pallet C', by raising the interval-rack M, brings the surface L of the incline J under the said arm F. When the interval lock-work is for the third time released in striking the twentieth hour, it will be caught by the engagement of the said arm F with the said surface L, and the hammer-detent D brought into the range of the extension of the lift-arm A of the main hammer B, whereby the said extension C will engage with the said detent D and hold the said hammer B without stopping the train, which will be arrested by the falling of the rack-detent D' into the stop-notch N of the interval-rack M, and the train will be stopped with the main hammer B held by the hammer-detent D. Thus the twentieth hour is signaled by two ding-dong strokes.

The phases detailed for signaling the eleventh hour are repeated for signaling the twenty-first hour, except that in the latter case two ding-dong strokes precede the interval, and the remaining hours of the day are signaled by two ding-dong strokes, followed by an interval and succeeded by two, three, and four simple strokes.

My invention comprehends, broadly, mechanism for temporarily holding a hammer between its strokes against impact with its bell or gong, for the production of the interval required in digital striking without stopping the striking-train; and it is apparent that the mechanism herein shown for the purpose may be modified and altered.

If desired, the auxiliary hammer may be dispensed with and other means than the ding-

done employed for distinguishing the hours. Thus the hours one to ten, inclusive, may be struck in the usual manner, then from eleven to nineteen, inclusive, with the interval, and
 5 from and including twenty through the remaining hours with the interval, and with or without some particular signal for distinguishing the twentieth and second hours. I would therefore have it understood that I do not limit
 10 myself to the exact construction shown and described, but hold myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

I am aware that standard time has been
 15 struck digitately by means of two independently-operated hammers. I do not, therefore, broadly claim striking standard time digitately, or, in other words, by the use of pauses, but only striking standard time digitately by
 20 the use of a single hammer, which is temporarily held between its strokes against impact with its bell or gong, for the production of an interval without stopping the striking-train.

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

1. Striking mechanism for twenty-four-hour clocks, having interval mechanism for temporarily holding the hammer between its strokes
 30 without stopping the striking-train, substantially as set forth.

2. Striking mechanism for twenty-four-hour clocks, having a hammer-detent and mechanism for operating it in temporarily holding
 35 the hammer between its strokes without stopping the striking-train, substantially as set forth.

3. Striking mechanism for twenty-four-hour clocks, having a hammer-detent and interval
 40 and lifting cams for operating it in temporarily holding the hammer between its strokes without stopping the striking-train, substantially as set forth.

4. Striking mechanism for twenty-four-hour
 45 clocks, having an interval-cam located in the time-train, an interval-rack provided with an incline and connected with the said cam and the striking-train, a lifting-cam located in the striking-train, and a hammer-detent operated
 50 through the said cams in temporarily holding the hammer without stopping the striking-train, substantially as set forth.

5. Striking mechanism for twenty-four-hour clocks, having an interval-cam located in the time-train, an interval-rack provided with
 55 an incline and a stop-notch and connected with the interval-cam, a striking-cam located in the time-train, a striking-rack connected with the striking-cam, connections with the striking-train for operating the racks, a lifting-cam
 60 located in the striking-train, and interval lock-work including arms engaging with the incline and lifting cams, respectively, and a hammer-detent for temporarily holding the hammer without stopping the striking-train,
 65 substantially as set forth.

6. Striking mechanism for twenty-four-hour clocks, having interval mechanism for temporarily holding the hammer without stopping
 70 the striking-train, the said mechanism including an interval-cam having its periphery divided into three steps, substantially as set forth.

7. Striking mechanism for twenty-four-hour clocks, having interval mechanism for temporarily holding the hammer without stopping
 75 the striking-train, the said mechanism including a striking-cam adapted to drop a rack connected with the said rack, having a number of teeth corresponding to the number of strokes to be given, with an additional tooth for the
 80 interval during which the hammer is held, substantially as set forth.

8. Striking mechanism for twenty-four-hour clocks, having an extension connected with the lift-arm of the hammer, a hammer-detent
 85 for engaging with such extension for temporarily holding the hammer without stopping the train, and means for operating the detent, substantially as set forth.

9. Striking mechanism for twenty-four-hour
 90 clocks, having interval mechanism for temporarily holding the hammer between its strokes without stopping the striking-train, and an auxiliary hammer connected with the interval mechanism and co-operating with the main
 95 hammer in producing a ding-dong effect, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CHAS. STAHLBERG.

Witnesses:

ARCHIBALD BANNATYNE,
 EDWARD H. ROGERS.