W. K. MENNS.

SHIP'S BELL CLOCK.

APPLICATION FILED JUNE 14, 1910.

1,001,668.

Patented Aug. 29, 1911.

3 SHEETS—SHEET 1.

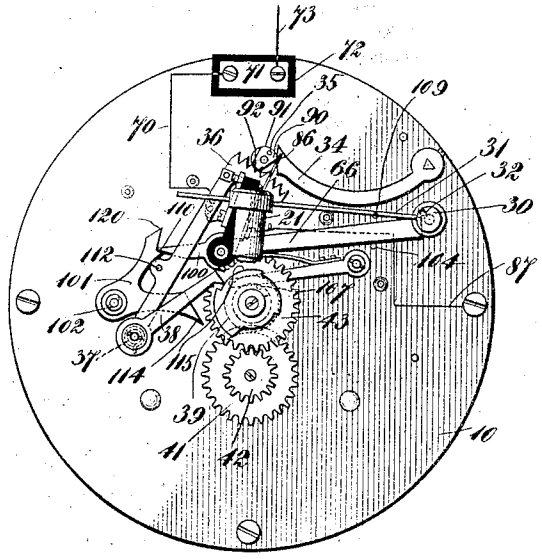

Fig. 1.

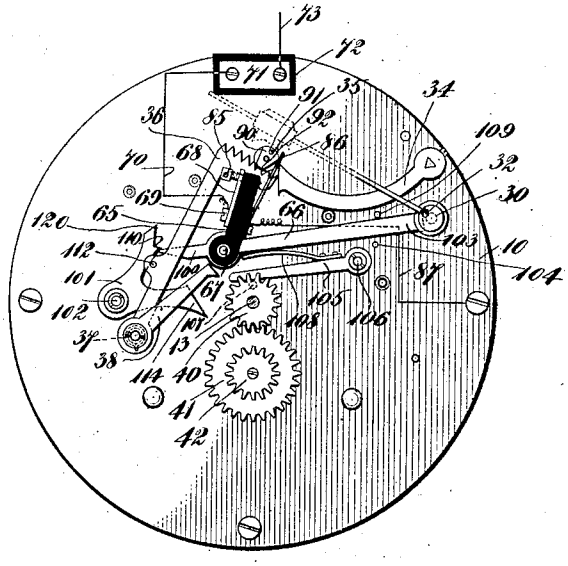

Fig. 2.

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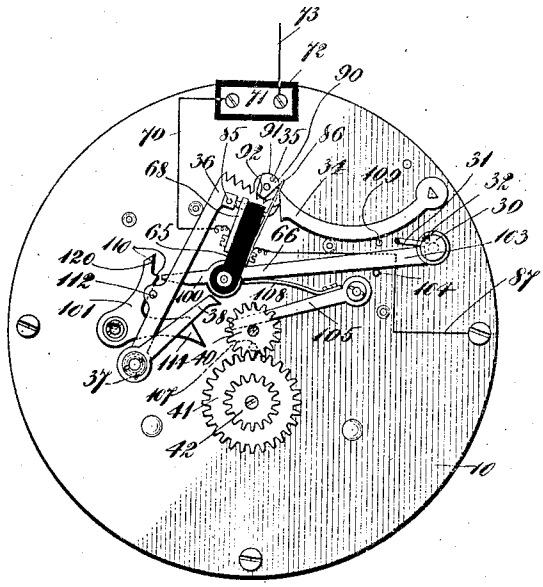

Fig. 3.

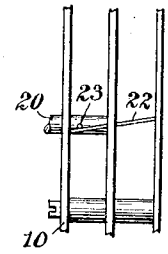

Fig. 4a.

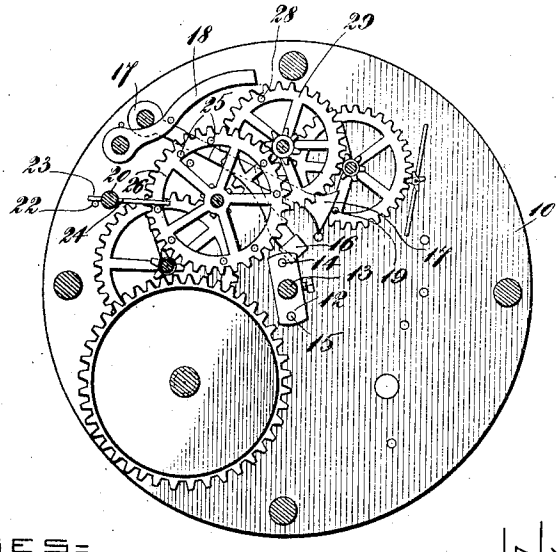

Fig. 4.

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3 SHEETS—SHEET 3.

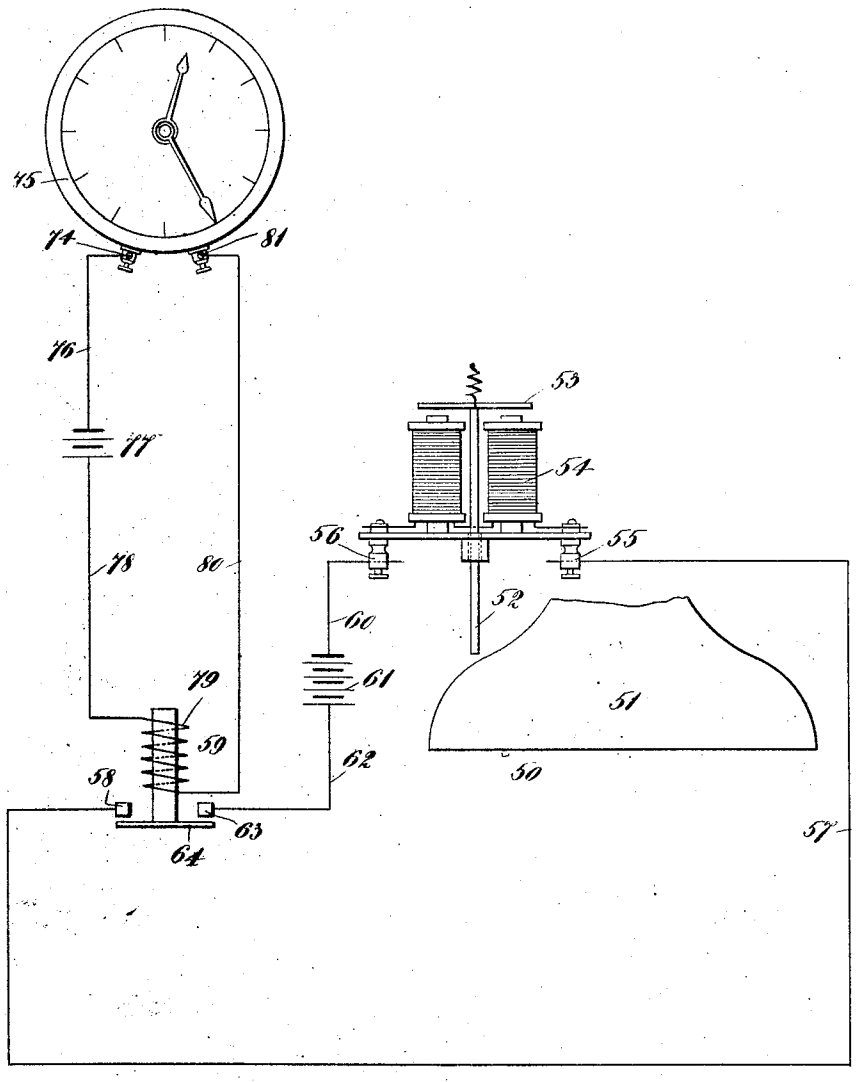

Fig. 5.

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UNITED STATES PATENT OFFICE.

WALTER K. MENNS, OF MALDEN, MASSACHUSETTS, ASSIGNOR TO CHELSEA CLOCK COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

SHIP'S-BELL CLOCK.

1,001,668. Specification of Letters Patent. **Patented Aug. 29, 1911.**

Application filed June 14, 1910. Serial No. 566,738.

To all whom it may concern:

Be it known that I, WALTER K. MENNS, residing in Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Ship's-Bell Clocks, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to ship's-bell clocks, that is, to clocks for audibly indicating the time by imitating the strokes of a ship's bell.

The object of the invention is to provide mechanism of the type above referred to for audibly indicating the time automatically and simultaneously at a plurality of localities.

With the above object in view a feature of the invention contemplates the provision of a ship's-bell clock having mechanism for audibly indicating the time by imitating the strokes of a ship's bell, and means for simultaneously controlling one or more sounding devices to imitate the strokes of a ship's bell at one or more points removed from the clock.

Furthermore, the invention comprises in addition to the features already referred to various combinations and arrangements of parts as well as certain details of construction which will be hereinafter fully described and defined in the claims.

The several features of the invention will be clearly understood from an inspection of the accompanying drawings and the following detailed description of the construction shown therein.

In the accompanying drawings Figure 1 is a plan view of a part of the striking mechanism and the contact mechanism, with the train ready to start; Fig. 2 is a similar view with the snail cam removed, the hammer intercepted and the electrical contacts separated as at the end of a half-hour indication; Fig. 3 is a view with the parts in normal position; Fig. 4 is a view of the striking train in the position of Fig. 1; Fig. 4^a is a fragmentary side elevation of the frame of the movement showing the spring for operating the hammer and Fig. 5 is a diagrammatic view of the system showing the clock and the mechanism for controlling one sounding device.

As shown in said drawings the striking train and associated parts are carried by the rear plate 10 of the frame of the movement, which is of well known construction.

The striking-train connected with the plate 10 is actuated by the lifting-block 12 mounted on the center arbor 13, as the pin 14 or 15 comes in contact with the spring blade 16, connected with the warn-lever 17, thus lifting the locking-lever 18 to permit the train to move until checked by the pin 19 on the warn-wheel coming against the warn-lever 17 to stop the train in position to begin a round on the gong. Extending parallel with the shaft 20 of the hammer 21 is a spring 22, one end of which is fastened to the front plate of the movement and the other presses against a pin 23 in the shaft 20 and tends to throw the hammer toward the gong (not shown). Another pin 24 extending from the hammer shaft, rests in the path of the pairs of pins 25, inserted in the striking wheel 26 of the train, the arrangement being such that two blows may be struck, then an interval of rest, followed by two blows and another interval of rest, till the striking wheel stops, when the locking-lever 18 drops into the path of and comes in contact with the pin 28 on the third wheel 29 of the striking train.

Outside of the plate 10 the hammer-hub 30 is secured to the shaft 20 and carries the wire 31 to which the hammer head 21 is attached. From the hub 30 a pin 32 extends for a purpose to be hereinafter explained. The dog 34, attached to the same shaft as the locking-lever 18, and the pin 35 of the gathering pallet act on the rack 36, which is under the tension of the coiled spring 37, and the arm 38 projecting from the rack adapted to come in contact with the snail 39, determines the travel of the rack, as is common. The snail, each step of which controls the strokes of the hammer for an hour, or two striking intervals, is moved at one fourth the speed of the minute hand by means of the snail-pinion 40 on the center arbor 13, meshing with the intermediate gear 41, and the connected pinion 42 meshing with the gear 43, to which the snail is attached.

The mechanism so far described would enable the hammer to strike double strokes or blows with an interval of rest between the double blows each half hour. In order to

audibly indicate the time according to the strokes of the ship's-bell clock simultaneously at a plurality of points, the following mechanism is provided: One or more sounding devices 50 are located at convenient places and their operation is controlled by the clock. Only one sounding device is shown in Fig. 5, but it is to be understood that any number may be employed. The sounding device comprises a bell 51 arranged in proximity to a rod or striker 52 connected to the armature 53 of a single-stroke electromagnet 54. The electromagnet is provided with two binding-posts 55 and 56, the former of which is attached to a conductor 57 leading to a contact 58 of a relay 59. The post 56 is connected by a conductor 60 to one pole of a battery 61, the other pole of which is connected by a conductor 62 with a contact 63 of the relay 59. The relay is provided with an armature 64 which is adapted to be brought into engagement with the contacts 58 and 63 to close the circuit which operates the sounding device 51. The operation of the relay is controlled from the clock by the following mechanism: A block 65 of insulating material is mounted upon the hub of a rocker 66, pivoted upon a stud 67, and carries a plate 68 having a binding post 69 to which one end of a conductor 70 is attached. The other end of the conductor 70 is attached to a metal plate 71 mounted upon an insulating block 72, carried by the plate 10 of the movement frame. A conductor 73 leads from the plate 71 to a binding post 74, which is insulated from the metal case 75 of the clock. A conductor 76 connects the binding post 74 with one pole of a battery 77, the other pole of which is connected to a conductor 78, which in turn is connected to one end of the coil 79 of the relay 59, the other end of which coil is connected by a conductor 80 to the binding post 81, which is electrically connected to the metal clock-case 75.

An adjustable contact screw 85 is threaded in the plate 68 and projects through the insulating block 65 into coöperative relation with a contact spring 86 mounted on the opposite side of said insulating block 65 and electrically connected to the plate 10 by a conductor 87, said plate 10 being in electrical contact with the metal case 75. The spring 86 is moved periodically out of contact with the end of the screw 85, by a cam 90 mounted to rotate with the gathering pallet. This cam has two arcuate faces 91 and 92, of unequal extent. When the face 91 is in contact with the spring 86 the circuit is broken between the spring and the contact screw 85 to produce the interval corresponding to that between the pairs of strokes of the clock hammer. When the face 92 is in contact with the spring the circuit is broken during a short interval corresponding to that between the strokes of a pair of the double blows of the hammer. Thus when the contacts 85 and 86 are brought into and out of engagement the relay 59 is energized and deënergized, respectively, to close and open the circuit of the sounding device 50. With the mechanism so far described the sounding device 50 is operated to strike double blows with an interval of rest between the double blows, simultaneously with and corresponding to the blows of the striking mechanism of the clock.

To strike the gong of the clock odd blows and also to produce odd blows on the sounding device, the following mechanism is employed: The last attempted blow of the hammer is intercepted by means of the rocker 66, one end 100 of which is normally restrained in its motion in one direction by a detent 101 pivoted at 102 to the plate 10. The portion 103 of the rocker overbalances the portion 100 and the rocker will normally rest on the pin 104 in the plate 10; but in order to lift the portion 103 into the path of the pin 32 of the hammer hub, a detent 105 is pivoted at 106 to the plate 10 and has its free end in a position to be engaged by a pin 107 projecting from the inner face of the snail-pinion 40. This pin is designed to come in contact with the detent arm 105 at the half-hours to raise said arm and thus strain a spring 108 mounted thereon and engaging the under side of the rocker 66, to lift the end 103 of the latter to intercept the pin 32. A limiting pin 109 is mounted in the plate 10 to limit the upward movement of the end 103 of the rocker.

Ordinarily the shoulder 110 of the detent 101, which is so pivoted on the plate 10 that it rests in contact with the end of the rocker, prevents the spring 108 from lifting the end 103 of the rocker; but a pin 112 is inserted in the rack 36, so that as the rack comes to its position of rest the pin will lift the detent 101 enough to allow the rocker to snap by the shoulder 110, the projection 114 of the detent preventing excessive motion and tending by its weight to restore the parts.

With the parts as shown in Figs. 1 and 5 the striking-train is ready to start, the pin of the lifting block 12 having come in contact with the spring blade 16 has removed the locking lever 18 from the stop pin 28 of the third wheel and allowed the train to move to starting position with the pin 19 in contact with the end of the warn-lever 17 and the first pin of the pairs 25 in the striking wheel resting under the pin 24 connected to the hammer shaft 20. The dog 34, which normally rests under the end of the rack 36 to hold the arm 38 clear of the snail 39, has been lifted so that the arm 38 may be forced into contact with the

snail by the spring 37 to determine the number of strokes of the hammer. As the lifting block passes from under the blade 16 the warn-lever falls to release the train; and the dog 34 falls on to the teeth of the rack to prevent retrogression as it is advanced by the rotation of the gathering pallet 35 from the position determined by the step 115 on the snail. As the first pair of pins on the striking-wheel pass, the hammer is lifted, and the spring 22 causes it to deliver two blows in quick succession, to be followed by a rest till the next pair of pins repeat the blows in like manner. At the time under consideration—that is, an odd number of strokes—the pin 107 in the snail-pinion 40 will be positioned so as to press against the under side of the detent 105 and put pressure on the spring 108 tending to lift the end 103 of the rocker 66. This pressure has however been resisted until just after the odd stroke by the shoulder 110 of the detent 101. The last pin of the second pair on the striking-wheel 26 will lift the hammer, compress the spring 22, and free the hammer to deliver another blow; but meanwhile the rack 36 has been returned by the gathering pallet to its normal position, in which the pin 112 pushes back the detent 101 and frees the end 100 of the rocker from the shoulder 110. The spring 108 immediately throws up the end 103 of the rocker against the pin 109 into the path of the pin 32 of the hammer-hub and stops the hammer before the blow is delivered, the parts at this time being illustrated in Fig. 2, the mechanism having delivered three effective blows. When the rocker 66 is tilted into the position shown in this figure the insulating block 65 is also swung upwardly, the point of the contact screw 85 being drawn away from the contact spring 86 to such an extent that the latter is not allowed to contact therewith by the cam 90, thus preventing the closing of the circuit for the last stroke of the pair. Thus the sounding device 50 is controlled as already explained above, and the number of impulses of the sounding device corresponds to the effective strokes of the hammer. The snail pinion continuing its motion carries the pin 107 past the detent so that it no longer exerts pressure on the rocker; but the other parts remain as in Fig. 2 for about half an hour, or until the warn-lever again releases the train, and as the hammer is lifted by the first of the pins 25 the unsupported rocker falls to its usual position, resting on the pin 104, and as the end of the rocker passes the shoulder 110 the detent 101 falls until its projection 120 comes in contact with the end of the rocker. When the pins 25 pass the pin 24, the double strokes of the hammer begin, and as the rocker remains inactive the entire group governed by the step 115 of the snail is delivered to indicate that it is now four bells on the watch being considered, the parts being at the termination as indicated in Fig. 3, which is the normal position of the parts.

While I have illustrated and described a preferred embodiment of the invention, I am aware that many modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore I do not wish to be limited to all the details of construction shown and described therein, but

What I claim is—

1. The combination with a ship's bell clock having mechanism for audibly indicating the time by means of double strokes at regular intervals with intervening rests, and at alternate intervals by rendering one stroke ineffectual, of a sounding device, and means operatively related to the clock mechanism for controlling the operation of said sounding device to emit a sound simultaneously with the audible indications of the clock.

2. The combination with a ship's bell clock having mechanism to actuate a single hammer at regular intervals double strokes with intervening rests, combined with means at alternate intervals to render one stroke of said hammer ineffectual, of a sounding device, and means operatively related to said actuating mechanism for controlling the operation of said sounding device.

3. The combination with a ship's bell clock having striking mechanism producing at each half hour double strokes with intervening rests, combined with means at alternate half hours for preventing the last blow of the double stroke of the striking mechanism from sounding the gong, of a sounding device, and means operatively related to the striking mechanism for controlling the operation of the sounding device whereby the latter will be sounded simultaneously with the sounding of the clock gong.

4. The combination with a ship's bell clock having mechanism to actuate a single hammer at regular intervals double strokes with intervening rests, combined with means at alternate intervals to render one stroke of said hammer ineffectual, of a sounding device, electrical means for operating said sounding device, and means operatively related to the clock mechanism for controlling the action of the electrical operating means, whereby the sounding device is operated simultaneously with the gong of the clock.

5. In a clock, mechanism to actuate a hammer at regular intervals double strokes with intervening rests, a contact device, and

means at alternate intervals to render one stroke of the hammer and the contact device ineffectual.

6. In a clock, the combination of a hammer, a gong, means for actuating the hammer each hour double strokes with intervening rests, a make-and-break electrical contact device, and means operative at each half hour to prevent the last blow of the last double stroke of the hammer from sounding the gong and to separate the cooperating members of the contact device.

7. In a clock, the combination of a striking mechanism actuated in double strokes at regular intervals, a rocker yieldingly positioned by the time train, a pair of electrical contact members, means for controlling the movement of said contact members simultaneously with the striking mechanism, and a detent control to cause the rocker at alternate intervals to stop a blow of the hammer and to separate said contact members.

8. In a clock, the combination of mechanism to actuate a hammer to deliver double strokes with intervening rests, a rocker, a pair of contact members, means for controlling said contact members in unison with the strokes of the hammer, a detent, and means for actuating the detent to cause the rocker to intercept a blow of the hammer at certain intervals and to also prevent the contact of said contact members.

9. In a clock, the combination of a striking mechanism, a pair of contacts, means cooperating with the striking mechanism for separating said contacts during alternate intervals of unequal length, and means for moving said contacts out of coöperative relation at alternate intervals.

10. In a clock, the combination of a striking mechanism, a pivotally mounted insulating support, a relatively stationary contact carried by said support, a relatively movable contact carried by said support, a cam operatively related to the striking mechanism for holding said relatively movable contact out of engagement with said relatively stationary contact during alternate intervals of unequal duration, and means for moving said support to separate said contacts out of coöperative relation.

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

WALTER K. MENNS.

Witnesses:
WILLIAM J. SPERL,
CHAS. F. HOWE.