D. W. BRADLEY.

Striking-Clock.

No. 221,210. Patented Nov. 4, 1879.

FIG. 1.

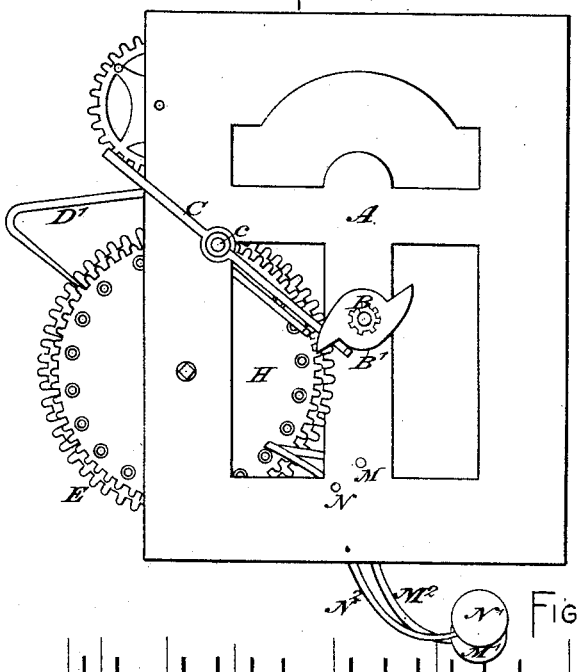


FIG. 2.

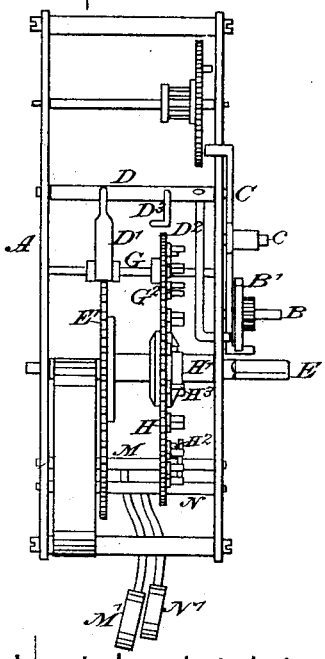


FIG. 3.

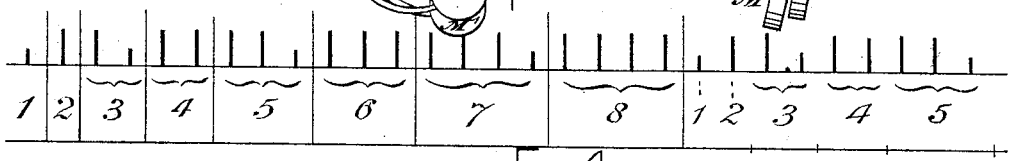


FIG. 4.

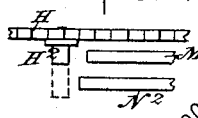


FIG. 5.

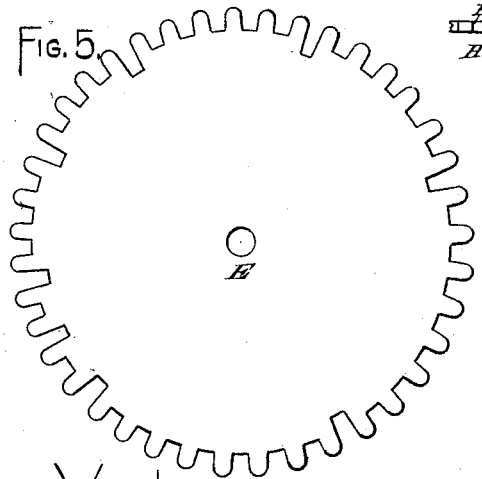
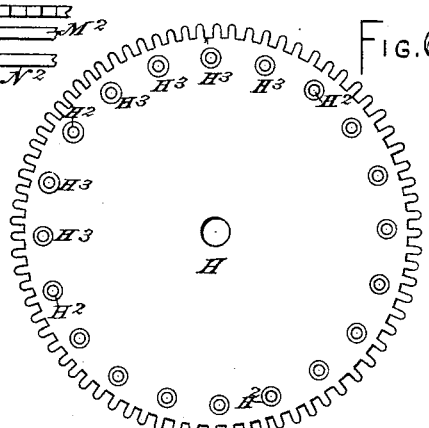


FIG. 6.



WITNESSES:

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E. B. Bolton

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UNITED STATES PATENT OFFICE.

DUDLEY W. BRADLEY, OF BROOKLYN, ASSIGNOR TO THE SETH THOMAS CLOCK COMPANY, OF NEW YORK, N. Y.

IMPROVEMENT IN STRIKING-CLOCKS.

Specification forming part of Letters Patent No. **221,210**, dated November 4, 1879; application filed March 22, 1879.

To all whom it may concern:

Be it known that I, DUDLEY W. BRADLEY, of Brooklyn, Kings county, in the State of New York, have invented certain new and useful Improvements relating to Striking-Clocks; and I do hereby declare that the following is a full and exact description thereof.

My improved clock strikes the proper number of blows at the proper time to correspond with the long-established nautical bells; and it strikes the blows with the same intervals of time as is customary in striking the bells on ship-board—that is to say, when two bells or more are struck they are in pairs closely associated. In striking eight bells there are first two bells close together, then two more and a long interval, and so on, till four double strokes have been given. This is important, not only to conform with the habits and prejudices of an important class of the community, but to aid men in listening under unfavorable conditions, in storms and otherwise, in counting the number of bells that are struck.

I have carried out the invention by means of two hammers operated by the same striking-wheel, but so proportioned that one is liberated and strikes a little in advance of the other. Both strike on the same bell.

The accompanying drawings form a part of this specification, and represent what I consider the best means of carrying out the invention.

Figure 1 is a face view of the portion of the works which involves the invention. Fig. 2 is an edge view. Fig. 3 is a diagram illustrating the way in which the long and short pins are arranged around the wheel. This diagram shows the arrangement extended in a right line.

The remaining figures are on a larger scale.

Fig. 4 is a section of a portion showing the relation of the short and long pins to the two levers operating with two hammers. The strong lines represent a short pin, which strikes only one lever, M^2. The dotted outline shows the increased length of the long pins, which are adapted to strike and operate both levers, M^2 and N^2.

Fig. 5 is a side view of the count-wheel detached. Fig. 6 represents the stroke-wheel detached.

Similar letters of reference indicate like parts in all the figures.

A is the frame of the clock. B is the shaft of the minute-hand, and B′ is a cam fixed thereon, which takes the place of the ordinary cam to liberate the striking mechanism at the proper intervals. Instead of being a single cam, so as to strike once in an hour, my cam B′ is a double cam, and induces a striking action every half-hour.

C is the lever, which is actuated by the cam B′. It turns on the center *c*, and performs its ordinary functions.

D′ is an arm from the shaft D, which, as also the arms D^2 D^3, perform their usual functions relatively to the count-wheel, and also to the catch-wheel, by means of which the striking is arrested when the proper number of blows has been struck, and the count-wheel allows the shaft D to assume the proper position therefor.

E′ is the count-wheel, mounted on the winding-shaft E. It is adapted to serve in its ordinary relation to all the other parts, but differently graduated from the ordinary count-wheel.

H is the pin-wheel, which acts directly on the hammers. It is mounted on a sleeve, H′, which is fitted loosely on the shaft E, and is worked by the gear-wheel G^2 on the shaft G, so as to turn with a somewhat quicker motion than the count-wheel. This is of advantage in utilizing the effect of the spring; but the work might be done by fixing the pins on the face of the count-wheel in the ordinary manner, provided the pins were of proper length and properly arranged, as will now be described.

Some of the pins are shorter than the others. The action of the short pins, H^2, is to induce a blow by only one hammer. The long pins, H^3, act on both the hammers. The action of one of the long pins is to induce a blow by both hammers. This is due to the arrangement of the parts.

M′ N′ are the hammers. They are mounted on separate parallel shafts M N. Each shaft

has an arm marked, respectively, M^2 N^2, which terminate a little within the circle formed by the pins of the pin-wheel H; but the arm M^2 is shorter than the arm N^2. When a short pin, H^2, sweeps past, it engages only with the arm M^2, and induces a blow with the hammer M only. When a long pin, H^3, sweeps past, it engages with both the arms M^2 N^2, and causes both hammers to strike; but by reason of the increased length of the arm N^2 and the arrangement of the shafts, the releasing and the striking of the hammer N is a little delayed. In short, a short pin, H^2, strikes one bell. A long pin, H^3, strikes two bells. It follows that to strike one bell only a short pin, H^2, should act. To strike two bells only a long pin, H^3, should act. To strike three bells a long pin is required followed by a short pin. To strike four bells two long pins are required.

It will now be seen not only how the double blows on the bell are struck in quicker succession than a single hammer could be twice raised and dropped, but also why it is that the count-wheel is so unusually divided, having two spaces of equal length for one bell and two bells, then spaces of equal length for three bells and four bells, and the same for five bells, six bells, and for seven bells and eight bells.

The pins are equally spaced. The passage of a short pin, H^2, past the hammer is required for one bell, and the passage of only one pin, a long pin, requiring the same space on the wheel, is required for two bells. So of all the others. The passage of three long pins and one short pin strikes seven bells, and an exactly equal traverse of the count-wheel to induce the passage of an exactly equal space in the pin-wheel for long pins is required for eight bells.

It will be understood that all the other parts of the machinery not here represented or particularly referred to may be of any ordinary or suitable character.

Modifications may be made in the details within wide limits without defeating the object of the invention.

I believe it practicable to use these novel parts in addition to other ordinary striking mechanism. In such case the strokes for the nautical bells should be made on a different bell from that for the ordinary striking, and the bells should be of so different a tone as to be readily distinguished.

Certain parts of the invention may be used without the others; but I prefer the whole used together, as shown.

Some of the advantages due to certain features of the invention may be separately enumerated as follows: First, by reason of the two hammers, I am able to produce two blows in more rapid succession than would be possible were the same hammer to be lifted and dropped for each blow; second, by reason of the two hammers operated by the long and short pins, I am able to act with one hammer alone, or with both, as required, and to strike both the odd and even numbers of bells with simple mechanism; third, by reason of the separate pin-wheel H, running faster than the count-wheel, but controlled thereby, I am able to obtain a quicker motion and more efficient action of the pins than when the pins turn only with the motion of the count-wheel; fourth, by reason of the fact that I strike the required number in pairs, the two strokes of each pair following quickly, my clock conforms to the custom of the sea, and its indications are easier to be counted and understood under all the exigencies of sea-service.

I claim as my invention—

1. A marine clock having two hammers adapted to strike in quick succession, so as to strike two blows near together with greater intervals between them and the next, as herein specified.

2. In marine clocks, the two hammers M' N', in combination with the short and long pins H^2 and H^3, and with the count-wheel having two measures of equal length for the several graduations of the number of blows, as herein specified.

3. In marine clocks, the count-wheel E', graduated in sets of intervals, two alike in each set, in combination with provisions for striking with one hammer and with two, as required, by the same mechanism, all substantially as herein specified.

4. In marine clocks, the two wheels E' and H, with their connected gearing, adapted to induce a greater motion of the pins with a moderate traverse of the count-wheel, as herein specified.

In testimony whereof I have hereunto set my hand this 19th day of March, 1879, in the presence of two subscribing witnesses.

DUDLEY W. BRADLEY.

Witnesses:
CHARLES C. STETSON,
PHILLIPS ABBOTT.