

No. 749,495.

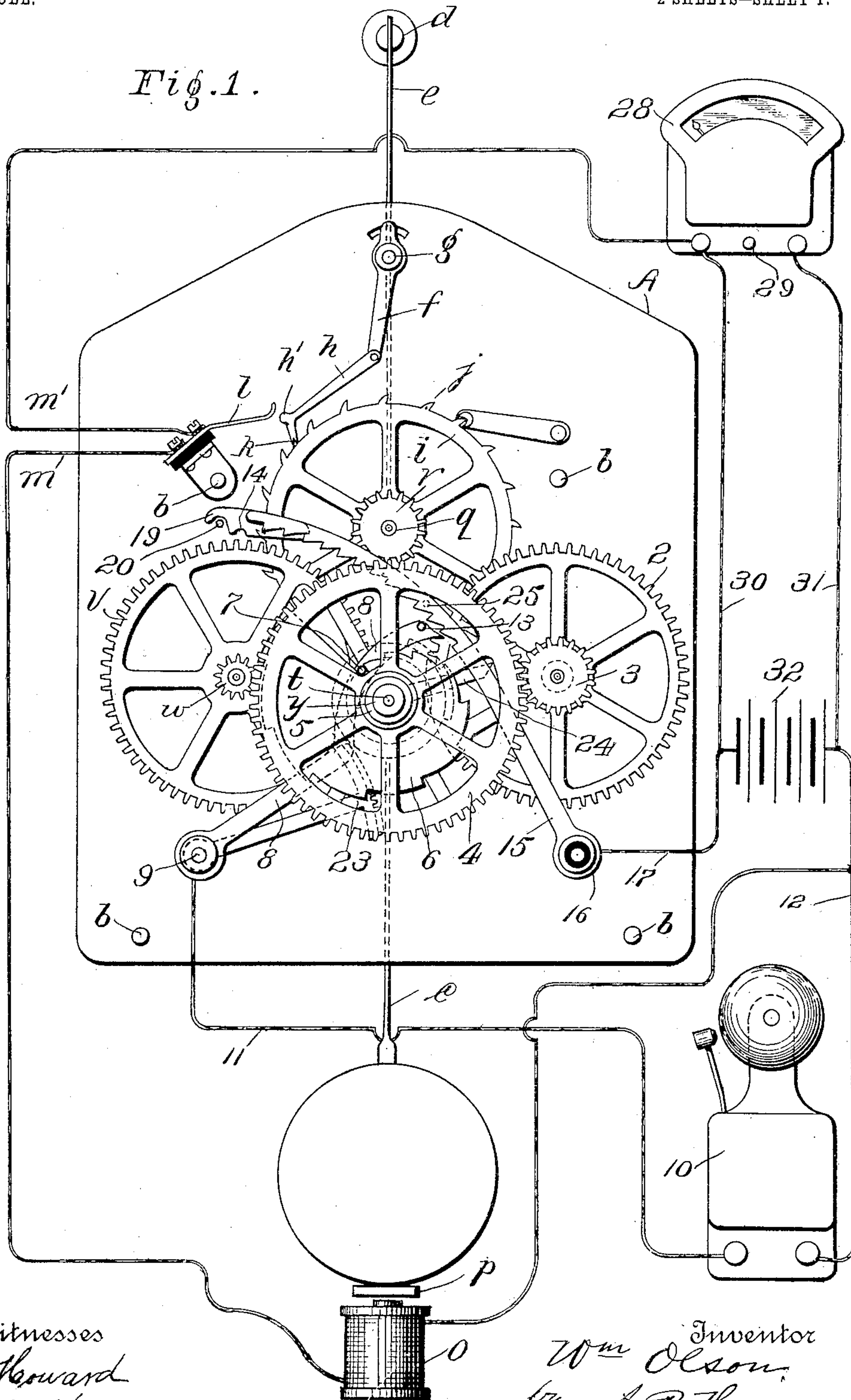
PATENTED JAN. 12, 1904.

W. OLSON.  
ELECTRIC STRIKING CLOCK.

APPLICATION FILED DEC. 31, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses  
*J. M. Howard*  
*E. Sedgwick*

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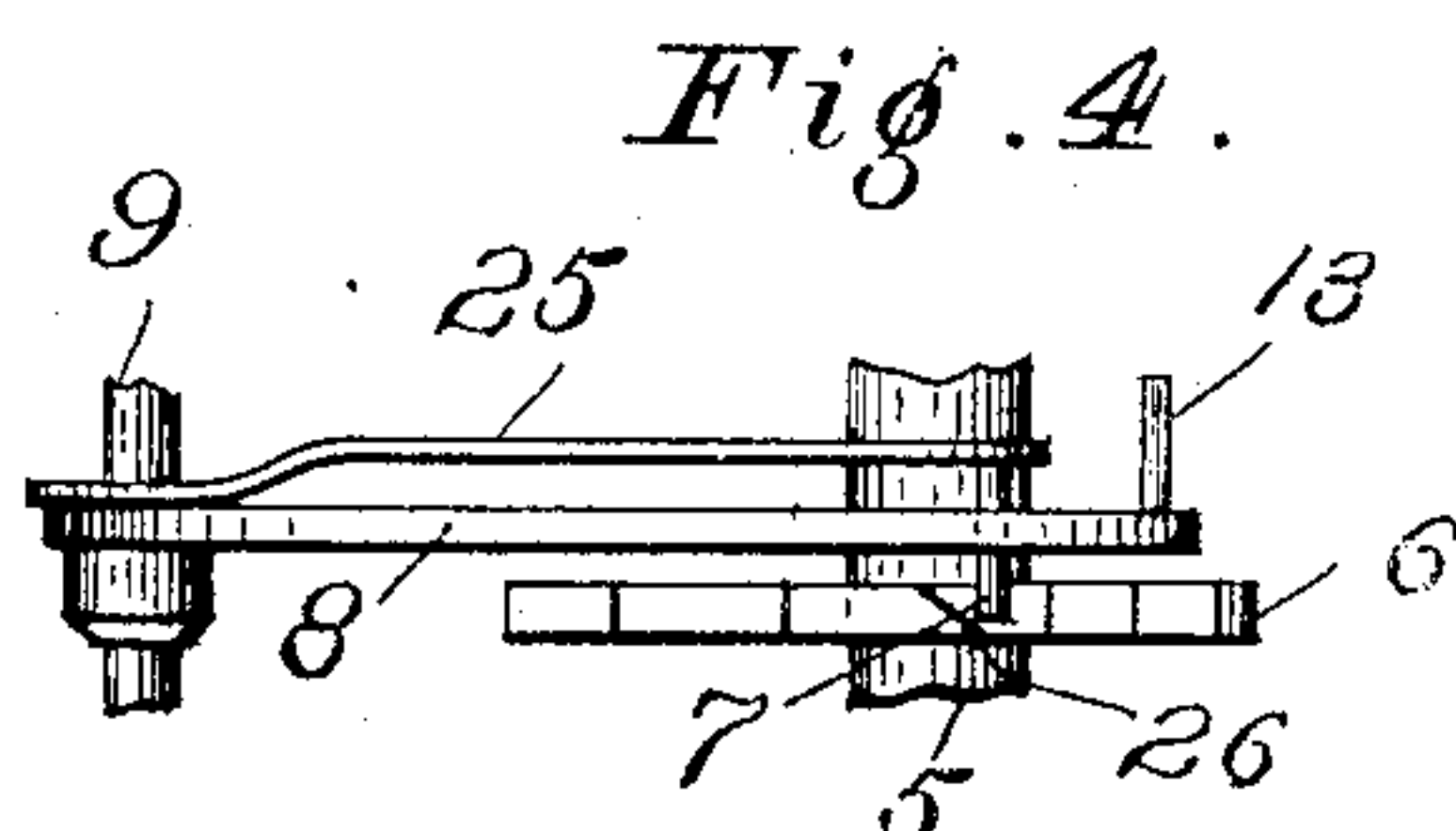
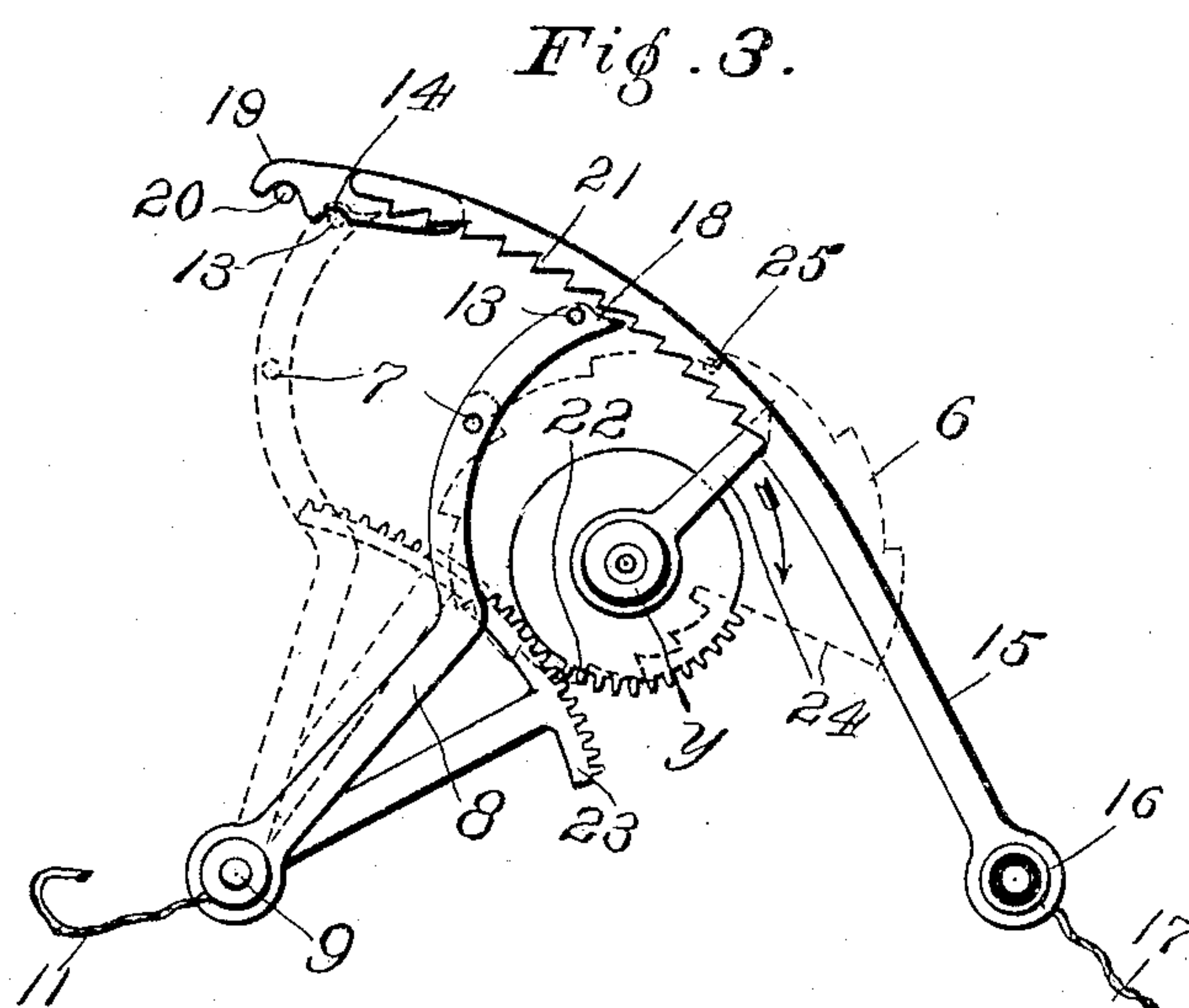
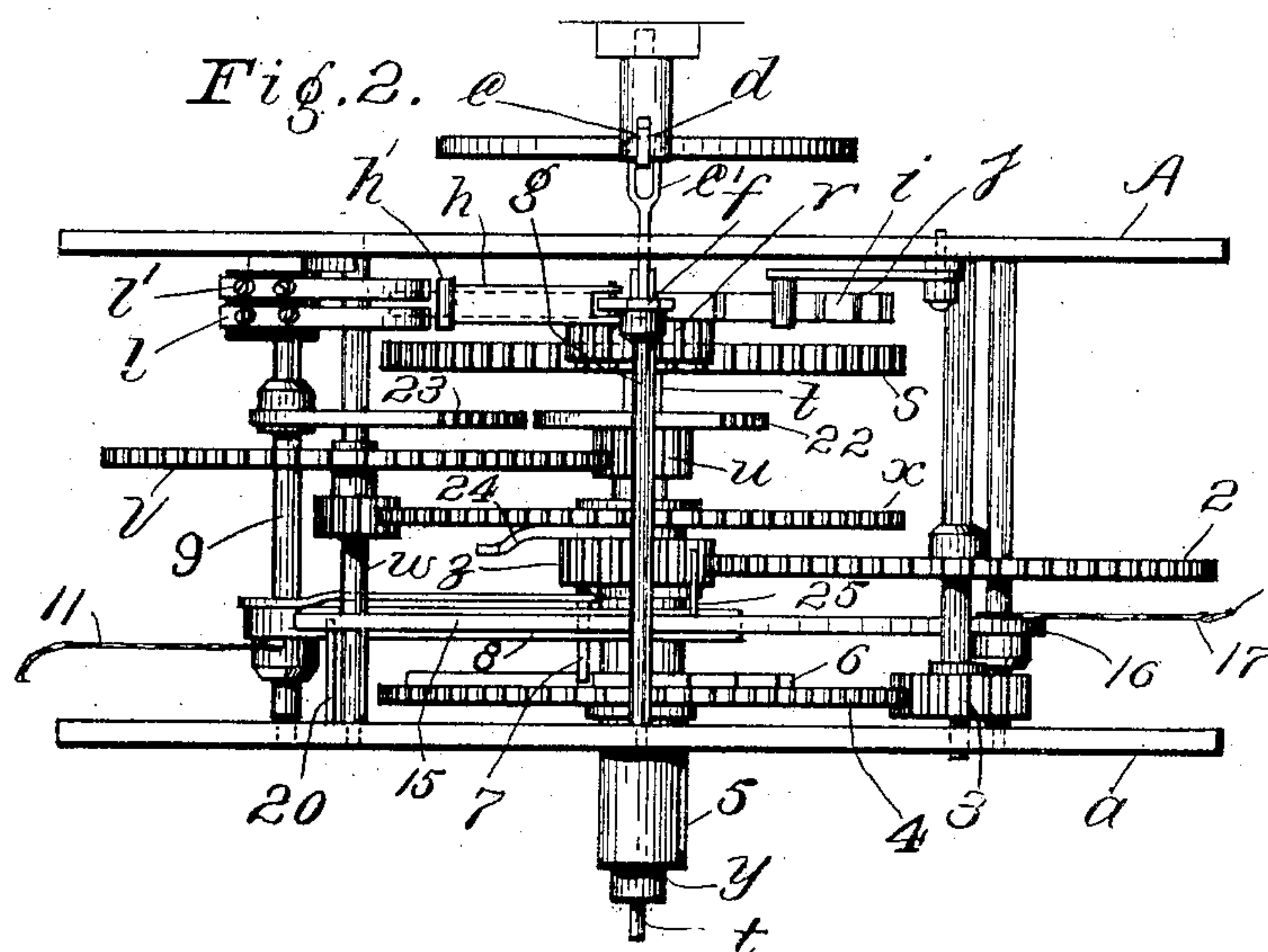
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C. Sedgwick

Inventor  
Wm Olson  
By his Attorney  
A. D. Thayer



# UNITED STATES PATENT OFFICE.

WILLIAM OLSON, OF JERSEY CITY, NEW JERSEY.

## ELECTRIC STRIKING-CLOCK.

SPECIFICATION forming part of Letters Patent No. 749,495, dated January 12, 1904.

Application filed December 31, 1902. Serial No. 137,232. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM OLSON, a citizen of the United States of America, and a resident of Jersey City, county of Hudson, and State of New Jersey, have invented certain new and useful Improvements in Primary Electric Clocks, of which the following is a specification.

My invention relates to the contact apparatus of the striking mechanism in primary electric clocks whereby it is designed to provide simple and more efficient apparatus, as hereinafter described, reference being made to the accompanying drawings, in which—

Figure 1 is a front elevation with the front housing-plate omitted of my improved clock, wire diagram, striker, and a voltmeter cut into the main circuit for testing the strength of the current from time to time. Fig. 2 is a top plan view of the clock mechanism. Fig. 3 is a detail in front elevation of part of the striking apparatus. Fig. 4 is a detail of part of the striking mechanism in plan view on a larger scale for greater clearness.

A represents the back housing-plate, in which the various arbors of the governing-works are pivoted at the rear end. *a* is the corresponding front housing-plate, in which the said arbors are pivoted at the front end. The said plates are coupled together by tie-rods *b*, (not shown in Fig. 2,) as usual.

The pendulum-rod *c* is suspended from the stud *d*, as usual, and has the usual flexible section *e* to permit vibration. To the pendulum-rod *c* is connected the extremity of the short arm of a pawl-lever *f*, pivoted to a support at *g* for being vibrated by the pendulum and carrying at the extremity of its long arm the pawl *h* for imparting a step-by-step movement to the prime-moving wheel *i* of the clock-train by successive operation on the teeth *j* of said wheel. The pawl-bit has a notch *k*, which when the amplitude of the movement of the pendulum is insufficient to carry the bit over a tooth *j* in the back movement catches on the point of the tooth, so that in the succeeding forward movement of the pawl it drives wheel *i* by taking effect on the point of the tooth, and its head *h'* is thereby carried into contact with the terminals *l l'* of the electric circuit

*m m'*, closing said circuit and energizing the electromagnet *o*, which takes effect on the armature *p*, carried by the pendulum-rod *c*, and thus revives the impelling force of the pendulum for a period of time, during which the pawl-bit will pass over the points of teeth *j* without closing the circuit, thus securing practical uniformity of the pendulum-action, and it is to be noted that said head *h'* of the pawl has sliding or rubbing contacts with said terminals, insuring clean conducting-surfaces. It is obvious that the teeth may be notched and points of the pawl adapted to engage in the notches for driving as well, and my invention includes both of these ways, which are equivalent devices. I do not, however, claim this pendulum-circuit-contact apparatus herein, it being intended to include it in another application.

The clock-train is of the usual construction, in which the arbor *q* of the driving-wheel *i* carries a pinion *r*, which gears with the wheel *s* on the seconds-hand arbor *t*, which carries the pinion *u*, which gears with the intermediate wheel *v*, on the arbor of which is a pinion *w*, that gears with the wheel *x* on the minute-hand arbor *y*, which carries the pinion *z*, that gears with the intermediate wheel 2, on the arbor of which is a pinion 3, that gears with the wheel 4 on the hour-hand arbor 5. This arbor 5 also carries the step-cam 6 of the striking mechanism, on the steps of which, respectively, an insulated stud-pin 7 of a contact-lever 8, which is carried on the rock-shaft 9 and connected in circuit with the gong 10 by the wires 11 12, falls preparatory to striking. Said lever 8 is then released from its normal position, (indicated by dotted lines in Fig. 3,) where it is held by the laterally-projecting insulated stud-pin 13, lodged in the notch 14 of another contact-lever 15, pivoted at 16 and thereat connected with the wire 17 of the battery-circuit, the pivot 16 being insulated. This lever 15 is placed in the same vertical plane as the lever 8 and ranges over the pointed free end 18 of said lever and normally lodges at its upper end 19 on an insulated stud-pin 20, supported in a fixed position. This lever 15 is in its upper portion curved to an approximate axis of lever 8 and has twelve contact-



teeth 21 on a portion of its edge confronting said lever 8.

The seconds-hand arbor *z* carries a toothed segment 22, which coacts with a toothed segment 23 on the rock-shaft 9, and said arbor *y* also carries a tappet 24, which takes effect on the laterally-projecting stud-pin 25 of the contact-lever 15 to trip lever 8 at the proper time for operating the striking-gong, said tappet 24 passing under pin 25, lifts lever 15, which releases stud-pin 13 of lever B, allowing pin 7 to fall on one of the steps of the cam 6, by which the teeth of segment 23 enter into engagement with the teeth of segment 22, the point 18 of lever 8 swinging clear of the teeth of lever 15 while so falling in consequence of the lever 15 being so lifted. The segments 22 and 23 each have twelve teeth also. The parts are so arranged with relation to each other that whatever cam-step arrests the fall of contact-lever 8 by pin 7 the forward tooth of segment 22 will come into mesh with segment 23 as many teeth in advance of the hindmost tooth of said last-mentioned segment as are necessary for returning the lever 8 to its normal position, and the contact-point 18 of lever 8 will rest at the number of teeth 21 from the upper end of the range of the lever-teeth corresponding to the hour to be struck. Then segment 22, continuing its regular motion, will, through segment 23, return lever 8 to its normal position, causing contact-point 18 to make contact with the corresponding number of teeth 21 during the said movement, and thus cause a corresponding number of strikes of the gong. Thus I have provided very simple contact apparatus for the gong-circuit applicable to ordinary clock-movements without change of such movements. To avoid any conflict of the radial edge 24 of the step-cam with the pin 7 of lever 8 in case said edge should reach said pin before it swings clear of said edge after striking twelve, I have, instead of attaching said pin directly to the lever, placed it in a hole through the lever, so as to slide freely therein, and attached it to a laterally-working spring 25 and have beveled said radial edge of the cam, as shown at 26, Fig. 4, to thrust the pin back out of its way for clearing it. The spring returns the pin to its normal position again as soon as said pin reaches in its return to normal position greater radial distance than that of the cam.

It is important in the use of primary elec-

tric clocks to have simple means of testing the strength of the battery from time to time, because unless simple and easily operative means of such character is at hand such test is apt to be neglected to the detriment of regularity of operation and cause undue discredit of the clock. I therefore represent a voltmeter, as 28, in the clock-circuit in such proximity to the clock that it is only necessary to touch the switch-button 29 at any time to be informed, with no further trouble, when the strength of the current indicates need of change of the battery; but I make no claim for such application of the voltmeter. In this case I have connected the voltmeter in the striking-circuit by the wires 30 and 31; but it is immaterial in what manner it may be connected so long as the connection is with the battery 32, which operates the clock.

What I claim as my invention is—

1. The combination with the clock-train and the step-cam for controlling the striking apparatus, of the electric gong-circuit, respective tooth-pointed, and series notched contact-lever terminals of said circuit, and means for automatically closing said circuit through said levers and interrupting the same hourly the number of times corresponding to the number of the hour to be struck.

2. The combination with the clock-train and the step-cam for controlling the striking apparatus, of the electric gong-circuit, respective contact-lever terminals of said circuit, and means for automatically closing said circuit and interrupting the same hourly the number of times corresponding to the number of the hour to be struck, said means consisting of the series of contact-points of one of said terminal contact-levers confronting the contact-point of the other terminal lever, means for securing the said levers in their normal positions, means for controlling the set of one of said levers by the step-cam, the toothed segment and the lever-tripping tappet carried by the minute-arbor of the time-train, and the lever-actuating segment actuated by the seconds-hand-arbor segment.

Signed at New York this 28th day of November, 1902.

WILLIAM OLSON.

Witnesses:

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