

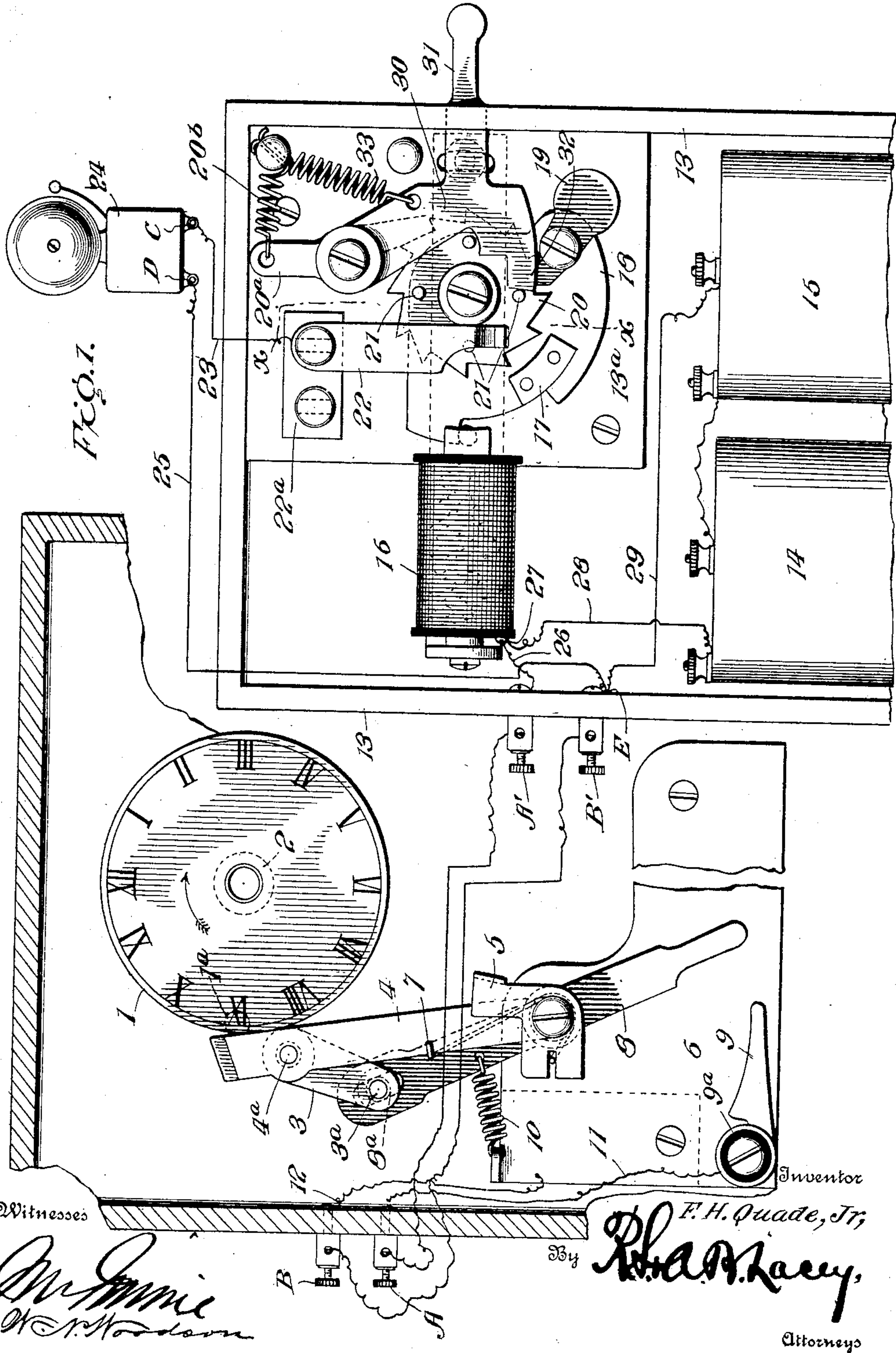
No. 865,428.

PATENTED SEPT. 10, 1907.

F. H. QUADE, JR.  
AUTOMATIC TIME SWITCH AND ALARM.

APPLICATION FILED DEC. 28, 1906.

2 SHEETS—SHEET 1.



Witnesses

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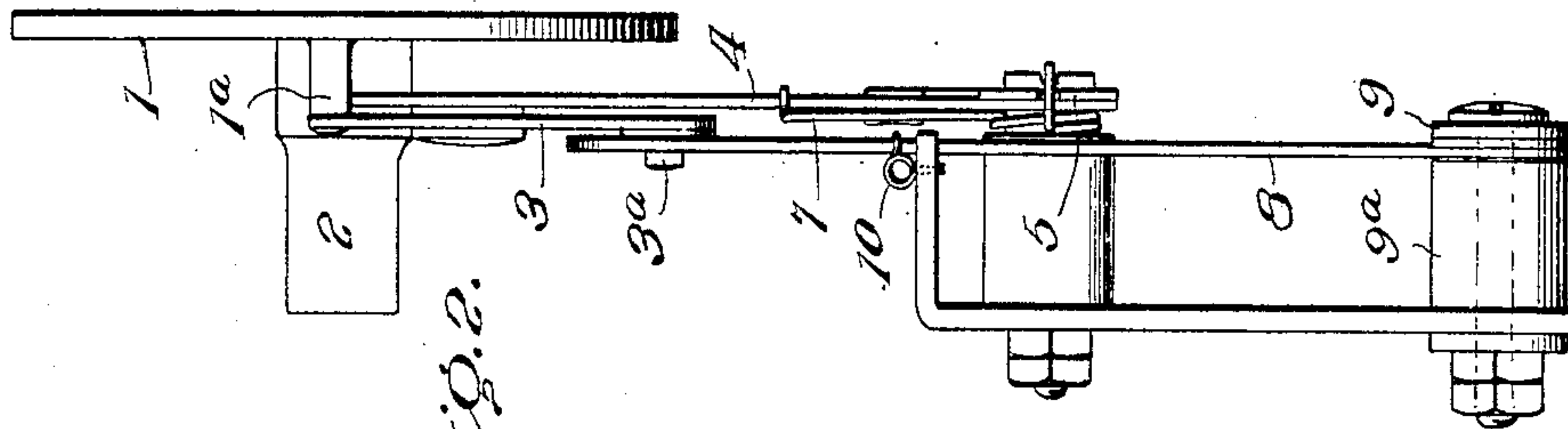


FIG. 2.

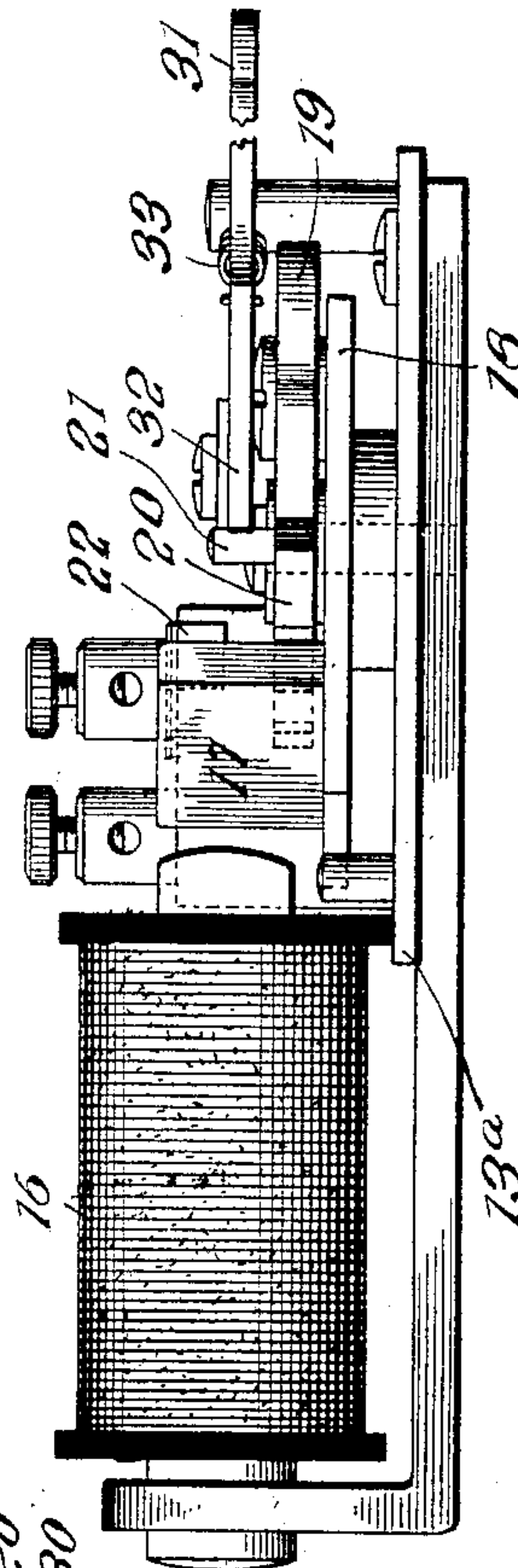


FIG. 4.

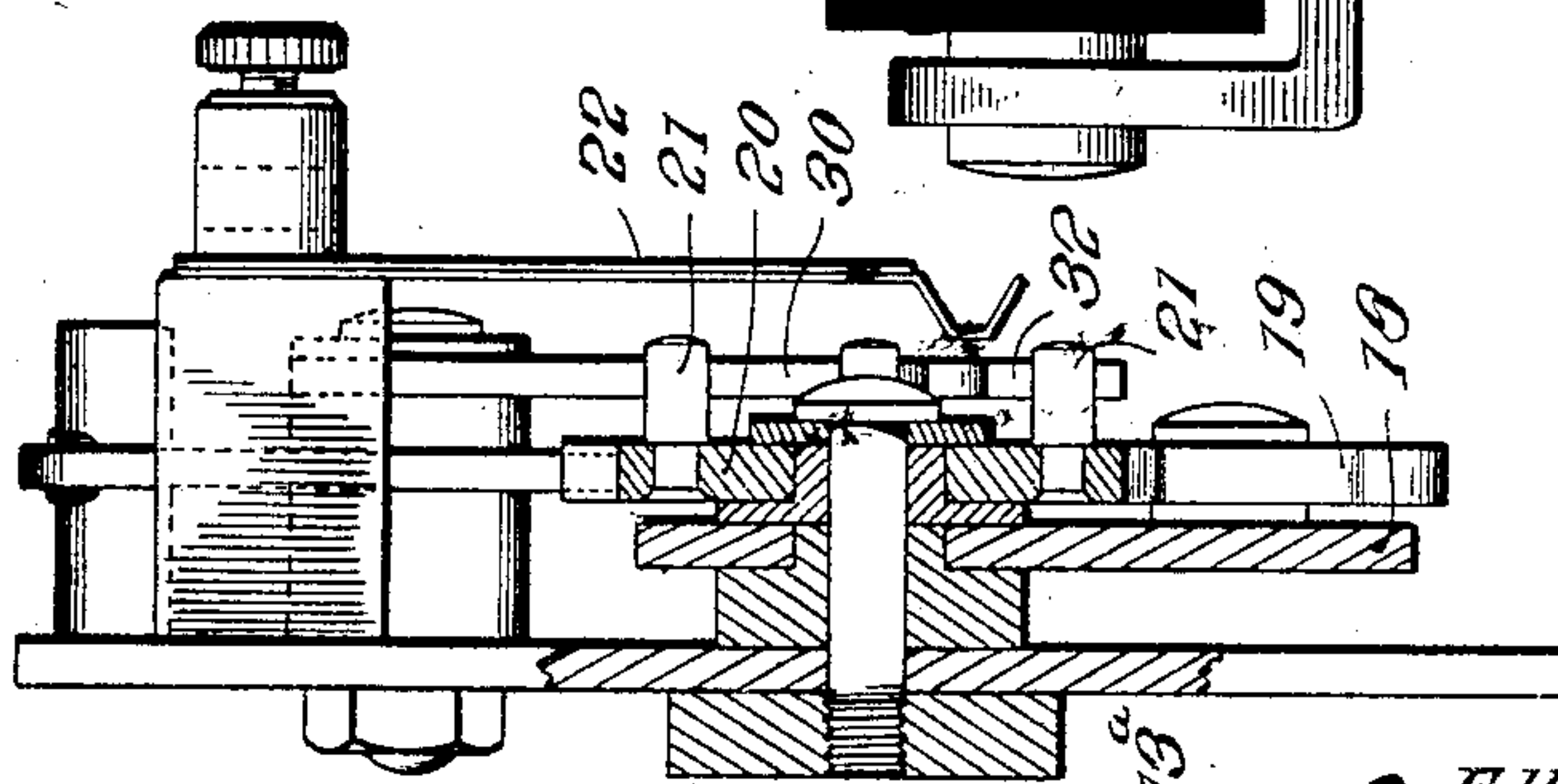


FIG. 3.

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# UNITED STATES PATENT OFFICE.

FRANK H. QUADE, JR., OF SAN FRANCISCO, CALIFORNIA.

## AUTOMATIC TIME SWITCH AND ALARM.

No. 865,428.

Specification of Letters Patent.

Patented Sept. 10, 1907.

Application filed December 28, 1906. Serial No. 349,894.

*To all whom it may concern:*

Be it known that I, FRANK H. QUADE, JR., a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have  
5 invented certain new and useful Improvements in Automatic Time Switches and Alarms, of which the following is a specification.

This invention contemplates certain new and useful improvements in automatic time switches and alarms  
10 of that type which are actuated by electricity so the time piece may be located at any distance from the alarm, and the object of my invention is to provide an improved automatic device of this character which will be composed of comparatively few and simple  
15 parts that will not be liable to get out of order, but will be durable in construction and efficient in operation and so arranged that the switch mechanism may be applied readily to any of the ordinary forms of clocks.

With this and other objects in view, as will more  
20 fully appear as the description proceeds, the invention consists in certain constructions, arrangements, and combinations of the parts hereinafter specifically described and claimed.

Reference is to be had to the accompanying drawings,  
25 in which:

Figure 1 is a side elevation of my improved automatic time switch and alarm mechanism. Fig. 2 is an edge view of the switch mechanism employed. Fig. 3 is a sectional view, with parts in side elevation, of a portion  
30 of the alarm mechanism, the section being taken substantially on the line  $x-x$  of Fig. 1. Fig. 4 is an edge view of said alarm actuating mechanism.

Corresponding and like parts are referred to in the following description and indicated in all the views  
35 of the drawings by the same reference characters.

Referring to the drawings, the numeral 1 designates a disk which has displayed on its outer face a series of numbers and graduations ranging from one to twelve and designating hours. This disk is carried on the end  
40 of the sleeve 2 which is adapted to fit snugly on the spindle of the hour hand of an ordinary clock, such as an eight day clock. The disk 1 is provided on its rear face with a projecting pin 1<sup>a</sup> which is adapted to engage and actuate a rocking trip device 3 pivoted intermediate of its ends upon a stud 4<sup>a</sup> carried by an arm 4.  
45 This arm is pivotally mounted at its lower end upon a standard or post 5 which projects out from an attaching plate 6 adapted to be fastened to any standard clock. A spring 7 is coiled around the post or standard  
50 5 and engages the rear edge of the arm 4, so as to press the upper free end of the same inwardly towards the disk and thereby hold the upper free end of the rocking trip 3 in the path of movement of the said pin 1<sup>a</sup>.

The trip device 3 is provided at its lower end with a  
55 pin 3<sup>a</sup> which works within a slot 8<sup>a</sup> in the upper end of a switch lever 8 which is fulcrumed intermediate of its

ends upon the post or standard 5 and which projects downwardly below the standard to operative contact relation with the terminal blades 9 which are of the jaw or spring pen variety. These blades are carried by  
60 a terminal or binding post 9<sup>a</sup>. A spring 10 is disposed upon the upper end of the lever 8 and tends to rock said lever in a direction to carry its brush or lower end out of contact with and away from the blades 9.

From the foregoing, it will be seen that as the hour  
65 hand of the clock moves around with its spindle, the disk 1 will also be carried around and finally the pin 1<sup>a</sup> will bear against the upper end of the trip device 3 and rock the same so as to move the switch lever 8, against the tension of its spring, in a direction to make contact  
70 with the blades 9, and that as soon as the pin 1<sup>a</sup> shall have passed the upper free end of said trip device, the spring 10 will at once break the circuit by pulling upon the upper end of said lever 8. 11 designates a lead  
75 which electrically connects the terminal or binding post 9<sup>a</sup> of the blades 9 with the terminal A, and 12 designates another lead which is connected to the terminal B of the switch mechanism and which is connected at its other end on to the clock frame at any convenient  
80 point, as shown.

In connection with the switch mechanism proper, I provide an alarm actuating mechanism which may be located at any reasonable distance from the switch mechanism embodied in or attached to the clock. For instance, the clock may be located in the bedroom of a  
85 house holder, and the alarm actuating mechanism in the servant's bedroom or kitchen. This alarm actuating mechanism may be embodied in a case 13 which may also contain the cell or cells arranged as an electric battery for the source of electric supply. In the pres-  
90 ent instance, I have shown two cells 14 and 15 connected in series.

16 designates an electric magnet, the armature 17 of which is carried upon a rocking segment 18, which also carries a gravity pawl 19 arranged for operative engage-  
95 ment with the teeth of a ratchet wheel 20, which is loosely mounted upon the same stud which carries the segment 18. The ratchet wheel 20 is provided with a plurality of contact studs 21 which project from one of its faces and which are adapted to successively contact  
100 with a brush or contact plate 22 which is preferably of spring material and which is supported by means of an insulated plate 22<sup>a</sup>, as shown.

20<sup>a</sup> designates a pawl adapted to engage with the teeth of the ratchet wheel 20 and pulled upon by a  
105 spring 20<sup>b</sup> for this action, the purpose of the pawl 20<sup>a</sup> being to lock, or prevent the movement of, the ratchet 20 in the reverse direction.

The contact or brush 22 is connected by a lead 23 to the binding post C of an electric bell or alarm 24. The  
110 other terminal or binding post D of this alarm is connected by a lead 25 to the binding post B<sup>1</sup> of the case 13.



The lead 26 connects the other binding post A' of the casing 13 to the electro-magnet 16, and the other end of the coil of the magnet or the other end of the magnet is fastened to a binding screw 27 which is grounded into the frame. From this binding screw 27 a lead 28 extends to one pole of the cell 14. The lead 25 of the binding post D of the bell, and the binding post B', is tapped at one point, as indicated at E and is connected from this point to the opposite pole of the other cell 15 by means of a lead 29. The alarm actuating mechanism is electrically connected to the switch mechanism by leads which extend from the terminal or binding post A' of the casing 13 to the binding post A and from the binding post B to the binding post B'.

In the practical operation of my improved automatic time switch and alarm, the disk 1 is turned in the direction of the arrow until the numeral designating the time at which it is desired the device shall operate, is in alinement with the hour hand of the clock. For instance, if it is desired that the alarm shall operate at six o'clock, the disk 1 is turned until its numeral 6 is underneath the hour hand at the place the hour hand happens to be when the device is set. Under no conditions must the hour hand, itself, be moved. As the hour hand turns, the disk 1 will turn with it, as they are both mounted upon the same spindle, and at the proper time, the pin 1<sup>a</sup> will engage with the trip device 3 and close the circuit by causing engagement of the switch lever 8 with the blades 9. This will be followed by the automatic opening of the circuit, but the instant the circuit has been completed the electro magnet 16 will have become energized and attract its armature 17 so as to swing the segment 18. This swinging movement of the said segment will cause the actuation of the ratchet 20 through the instrumentality of the pawl 19 and this will result in bringing a contact stud 21 into engagement with the brush or contact 22. The circuit through the bell will thus be closed and will be maintained closed until some means is provided to break this circuit.

In order to accomplish the breaking of the circuit, I have in the present instance, provided a throwout lever 30 which is pivoted to the same stud which carries the pawl 20<sup>a</sup> and which is provided with a handle 31 adapted to project out through one wall of the casing 13. The nose 32 of this lever is designed for engagement with one of the studs 21. Hence by moving the handle 31 downwardly, the ratchet wheel 20 will be turned to carry that stud which has been in engagement with the contact 22, out of said engagement, which will manifestly result in breaking or opening the current of the bell. The lever 30 is provided with a spring 33 which will bring it back to its normal inoperative position as soon as the handle 31 is released.

From the foregoing description in connection with the accompanying drawing, it will be seen that I have provided a very simple and efficient construction of automatic time switch and alarm in which two main circuits are employed, one circuit being embodied in the switch mechanism that is attached to or incorporated in the clock and which instantly opens as soon as it had been closed, and an alarm actuated circuit which is closed by the first named circuit and is maintained closed, even after the first named circuit has been opened, the alarm actuated circuit being held closed, and continuing the ringing of the bell until someone

has attended to pulling down the lever 31 and breaking this circuit.

It is manifest that the magnet may be adjustable according to the strength of the battery or batteries employed in connection therewith.

Having thus described the invention, what is claimed as new is;

1. In an automatic switch adapted to be operated by clock mechanism, the combination of a disk adapted to fit upon the spindle of a clock hand so as to move therewith, and provided with a tripping pin, a trip device pivoted intermediate of its ends and adapted to be engaged at one end by said pin, an arm to which said trip device is pivoted, switch blades, and a switch lever fulcrumed intermediate of its ends and arranged for engagement with said blades at one end, the other end of said lever having a loose pivotal connection with the said trip device.

2. In an automatic switch adapted to be operated by clock mechanism, the combination of a disk adapted to fit upon the spindle of a clock hand so as to move therewith, and provided with a tripping pin, a trip device pivoted intermediate of its ends and adapted to be engaged at one end by said pin, an arm to which said trip device is pivoted, switch blades, a switch lever fulcrumed intermediate of its ends and arranged for engagement with said blades at one end, the other end of said lever having a loose pivotal connection with the said trip device, and a spring connected to said lever and adapted to swing the same out of engagement with said blades.

3. In an automatic switch mechanism adapted to be operated by a clock mechanism, the combination of a disk adapted to fit upon the spindle of a clock hand so as to move therewith and provided with a tripping pin, a trip device pivoted intermediate of its ends and adapted to be engaged at one end by said pin, an arm pivotally mounted at one end and spring pressed towards said disk, said arm carrying the said trip device, contact blades, a switch lever fulcrumed intermediate of its ends and provided at one end with a slot, the other end of the trip device being provided with a pin working in said slot and the other end of said lever being arranged for contact with said blades, and a spring adapted to swing said lever out of engagement with said blades.

4. In an automatic alarm mechanism, the combination of an electro-magnet, means for automatically energizing said magnet at a predetermined time, a segment mounted to swing in juxtaposition to the core of said magnet, an armature for said magnet carried by the said segment, the segment being adapted for actuation by the attraction of said mechanism for its armature and the said segment being provided with a pawl, a freely turning ratchet arranged for actuation by said pawl and provided with a series of contact studs, a contact arranged for engagement by said studs successively, an alarm device included in the circuit of said electro magnet and said contact, and a source of electric supply for said alarm and electro magnet.

5. In an automatic alarm device, the combination with an electrically operated alarm, a source of electric supply, an electro-magnet adapted to be included in the circuit of said alarm and source of supply and arranged for energization at a predetermined time, a segment adapted to swing in juxtaposition to said magnet, an armature for said electro-magnet carried by said segment, a ratchet wheel, a pawl carried by said segment and adapted to actuate said ratchet, the ratchet being provided with a series of contact studs, and the alarm circuit including the contact adapted for engagement by said studs successively, and a throwout lever provided with a handle for its actuation and adapted to engage a stud of the ratchet, whereby to turn the ratchet wheel so as to break the contact between the ratchet wheel and the said contact of the alarm.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK H. QUADE, JR. [L. S.]

Witnesses:

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