

(No Model.)

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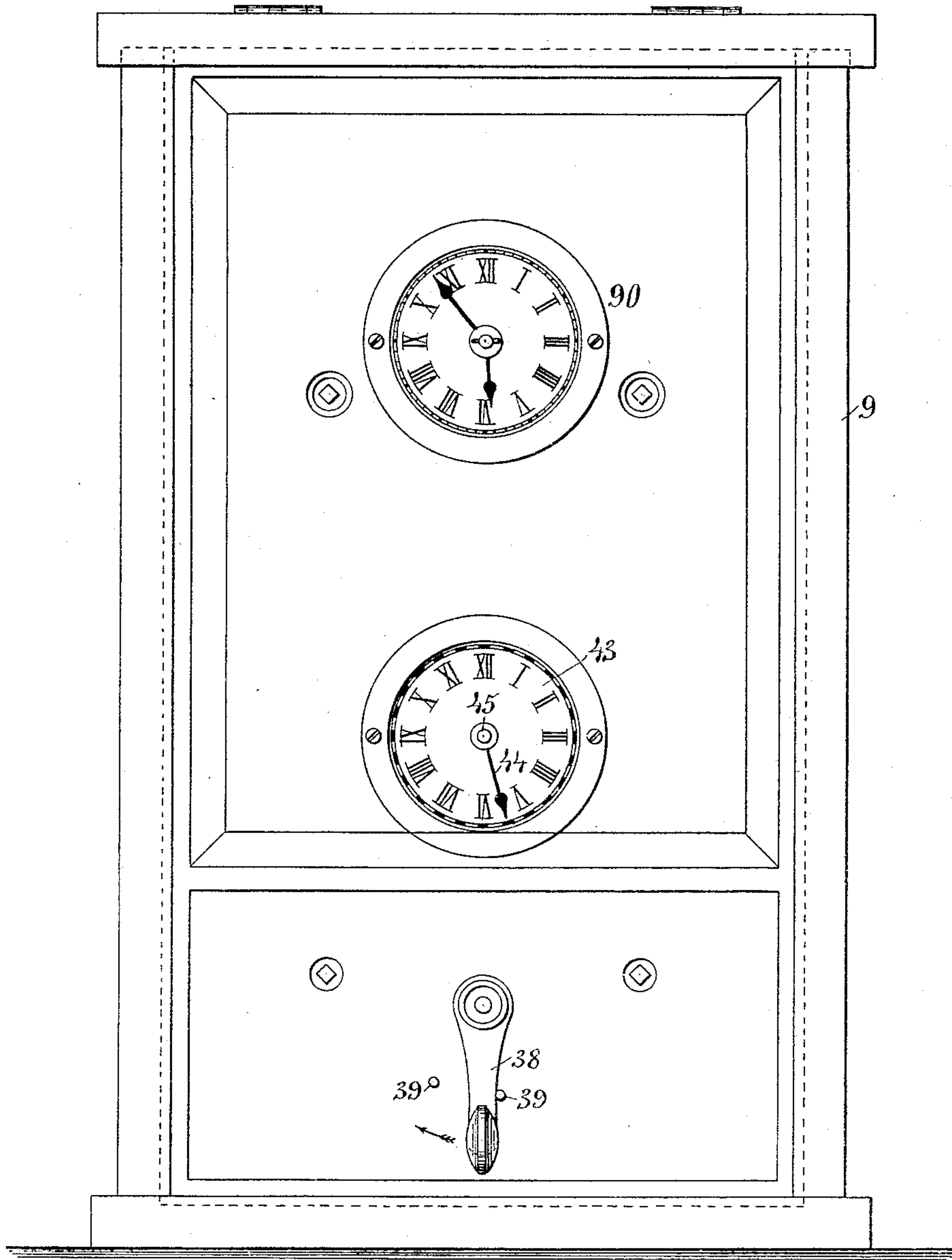
G. F. BULEN.

WATCHMAN'S ELECTRIC TIME RECORDER.

No. 386,767.

Patented July 24, 1888.

Fig. 1.



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(No Model.)

3 Sheets—Sheet 2.

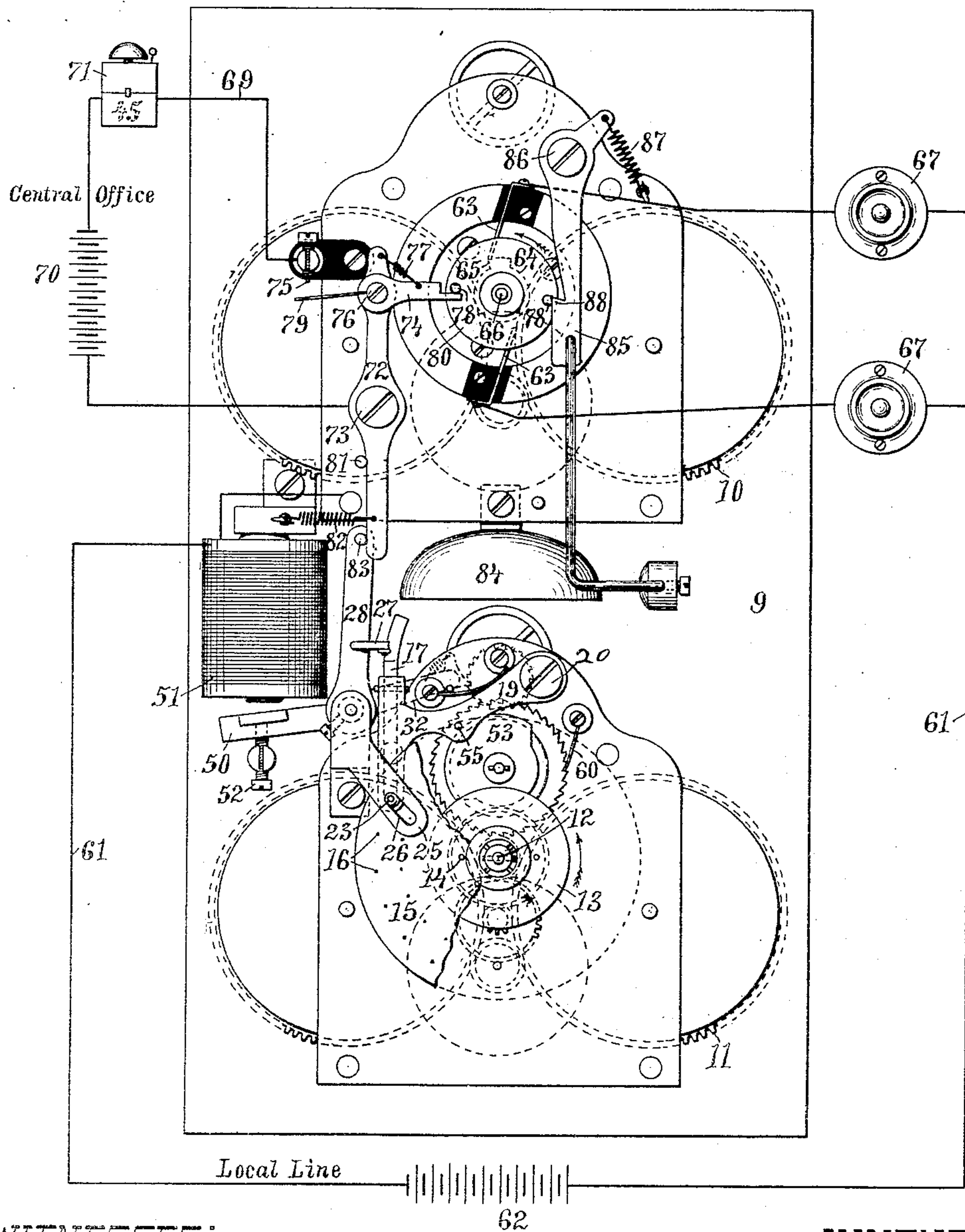
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Fig. 2.



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Fig. 3.

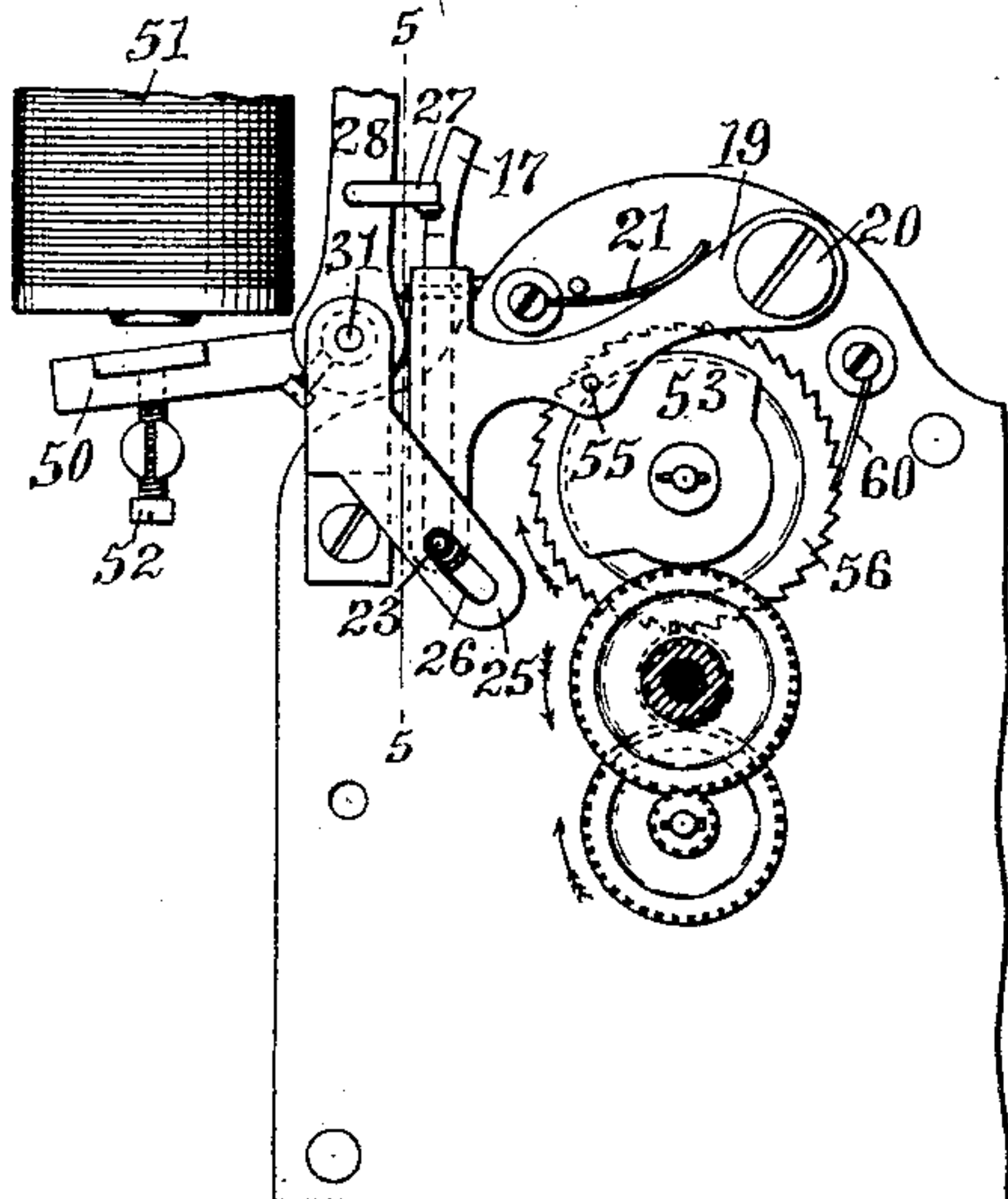


Fig. 4.

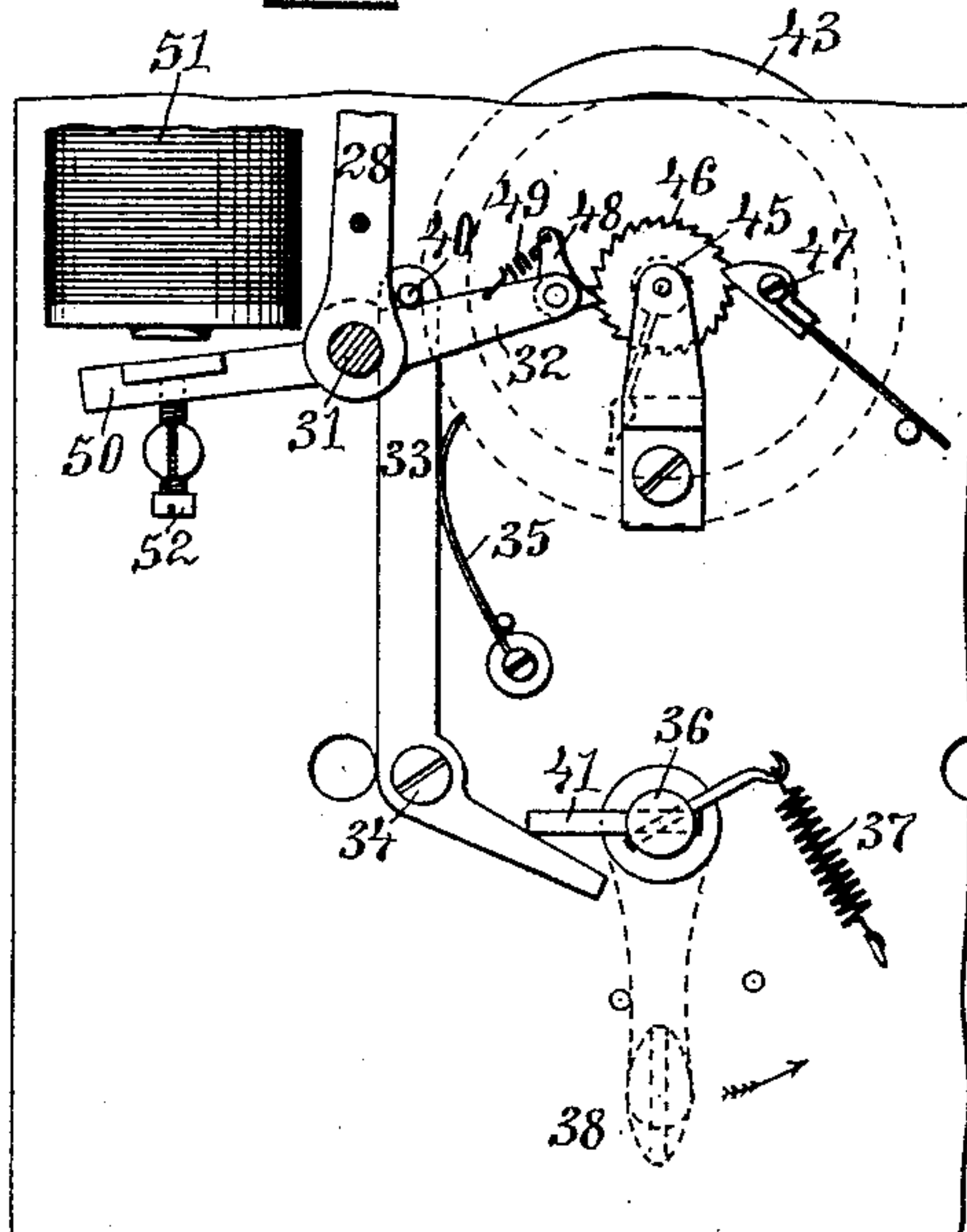


Fig. 5.

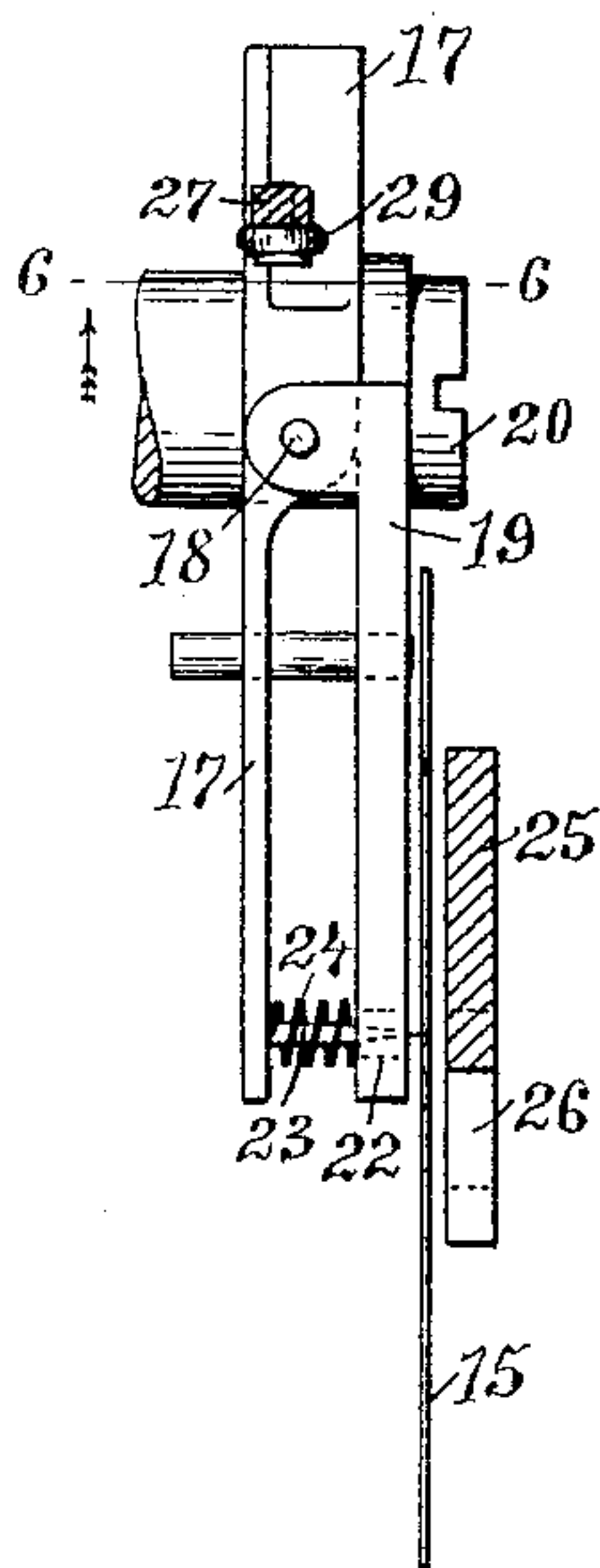


Fig. 6.

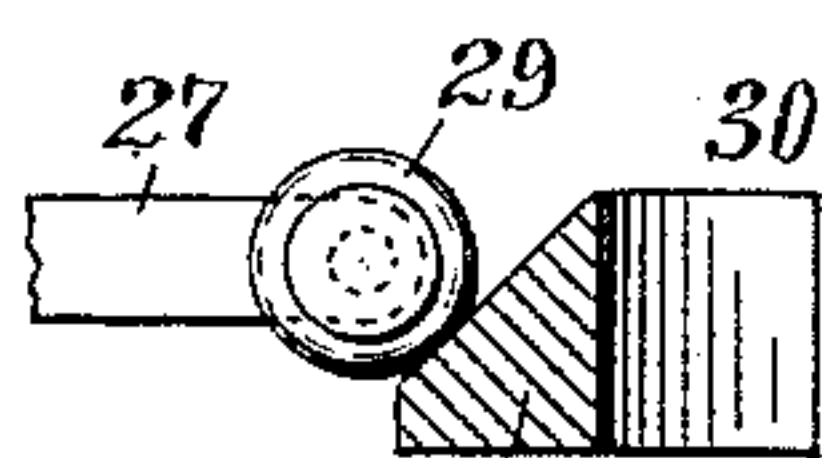


Fig. 7.

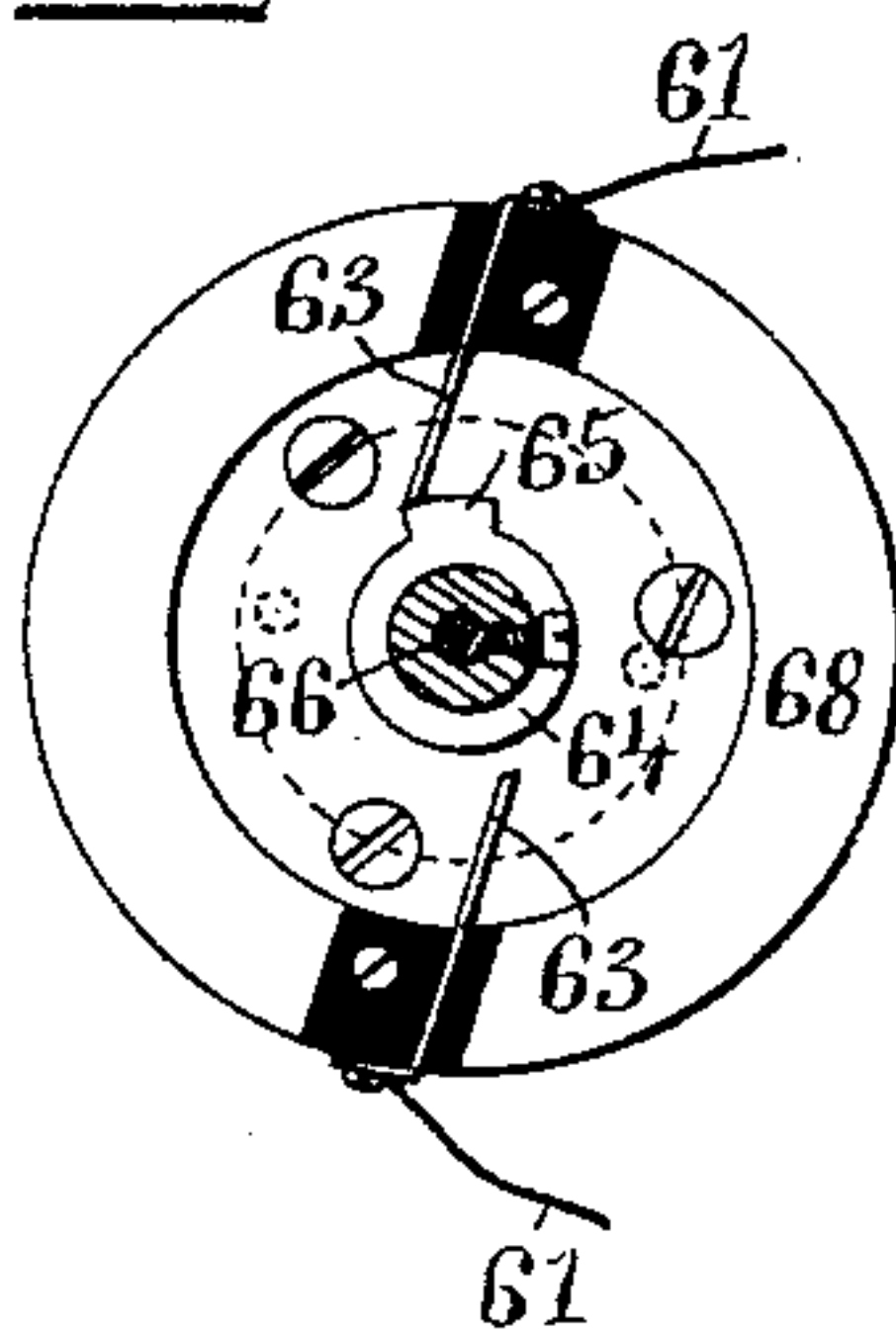
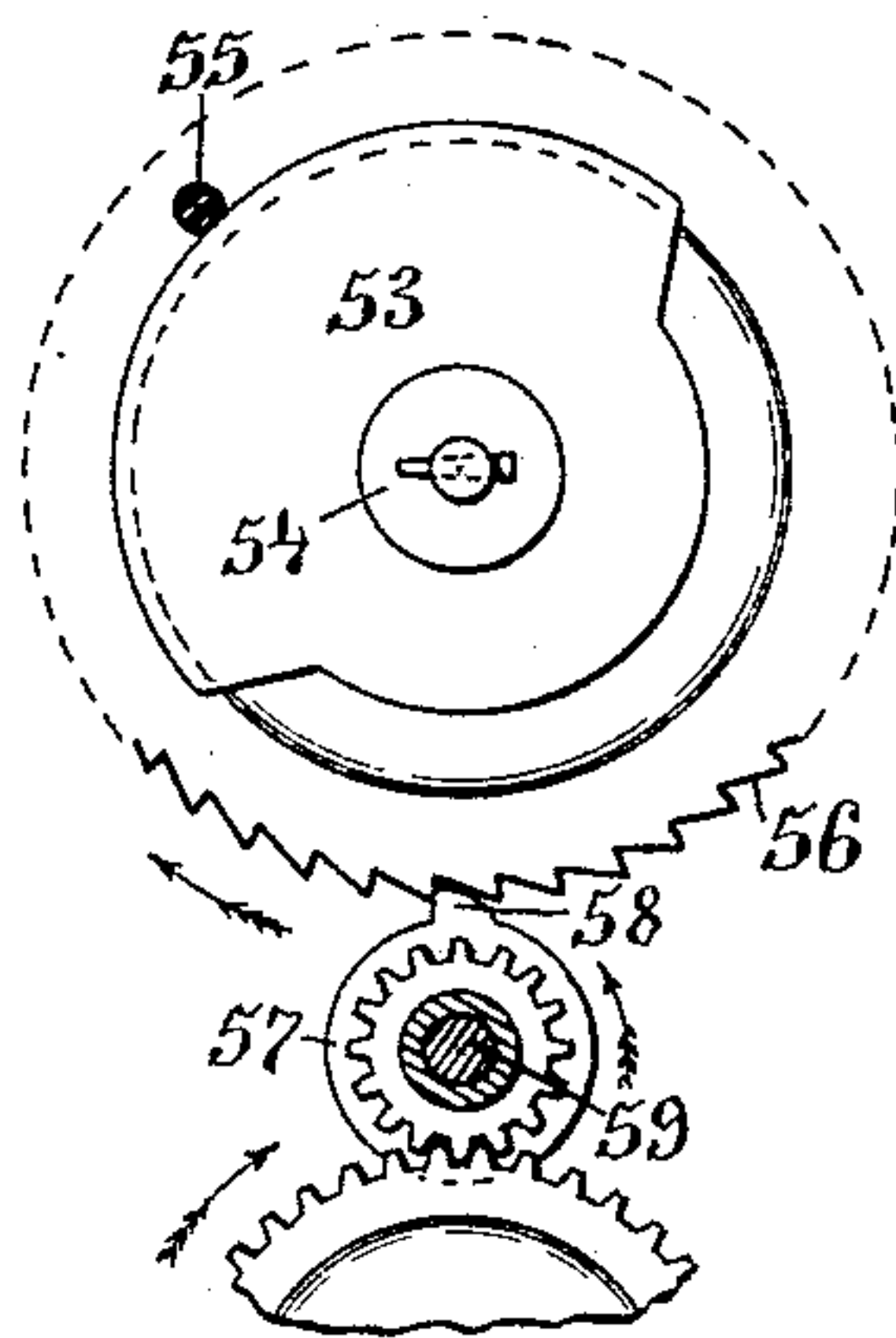


Fig. 8.



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UNITED STATES PATENT OFFICE.

GEORGE F. BULEN, OF BROOKLYN, NEW YORK.

WATCHMAN'S ELECTRIC TIME-RECORDER.

SPECIFICATION forming part of Letters Patent No. 336,767, dated July 24, 1888.

Application filed December 29, 1887. Serial No. 259,315. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. BULEN, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Watchmen's Electric Registering-Clocks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

10 This invention relates to what is known as a "watchman's registering-clock," by means of which a watchman can register or record at predetermined periodic times, to show that at such times he has been on duty.

15 The chief object of my invention is to at once make known the failure of the watchman to record by informing the central office through electrical communication, so that a person may be immediately sent out from the central office to the locality from which the informing signal has been received, in order to ascertain the cause of the watchman's failure to register at the predetermined times.

25 Another object of my invention is to give a warning signal to the watchman, to warn him that unless within so many minutes' time he operates the clock to register his neglect will be made known at the central station by an alarm.

30 Another object of my invention is to place the registering-clock, which is in electrical communication with a central station, under the control of a local circuit, so that the watchman may be compelled to register from several different places in the building remote from the room in which the clock may be located.

35 To the aforesaid purposes my invention consists in the certain novel and peculiar combinations, arrangements, and constructions of the several parts of the apparatus, all as hereinafter fully described and claimed.

40 In order that my invention may be fully understood, I have illustrated in the accompanying drawings, and will proceed to describe, the best form thereof so far devised by me, with the knowledge, however, that such form may be modified without making a substantial departure from the spirit of my invention.

45 In the accompanying drawings, Figure 1 is a front view of my improved electric register-

ing-clock. Fig. 2 is a rear view of the registering-clock arranged with the alarm or main circuit and the local circuit. Figs. 3 and 4 are partial detail views of parts of the recording 55 mechanism of the clock. Fig. 5 is an enlarged sectional view taken on line 5 5, Fig. 3. Fig. 6 is a sectional view on line 6 6 in Fig. 5, taken in direction of the adjacent arrow. Fig. 7 is a side view of the fixed disk carrying the contact-fingers and the moving circuit closing wheel, which is mounted on the rotating arbor shown in cross-section. Fig. 8 is an enlarged view of the cam and connected ratchet for rotating the cam and the wheel with a tooth for 65 driving the ratchet for shifting the position of the perforating-arm, as hereinafter explained.

Referring to the drawings, the number 9 designates the framing for the clock, which comprises an upper and a lower clock-train, 10 and 11, respectively. The upper train is provided with the ordinary dial and hands, 90, for keeping time.

The apparatus, combined with the lower clock-train, 11, constitutes the recording or 75 registering mechanism, and consists in the arbor 12, which may be driven in any suitable manner by the clock-train, so as to perform two revolutions every twenty-four hours. Upon the arbor 12 is secured a carrier-plate, 13, provided with holding-pins 14, upon which the paper record-disk 15 may be sustained, as shown clearly in Fig. 2. This record-disk rotates with the arbor 12, and the registering or recording at predetermined intervals is effected by perforating the disk, as at 16, by means of a perforating-arm, 17, which is pivoted on pin 18, mounted on the L-shaped bracket 19, which is pivoted on the stud 20, secured to the clock-frame. The L-shaped 85 bracket 19 is pressed upon by the spring 21, and its lower arm is formed with an opening, 22, through which works the needle or perforating-pin 23, which is encircled by the spring 24, the respective ends of which abut against 95 the opposite faces of the perforating-arm 17 and the bracket 19. The paper record-disk 15 rests against the fixed perforating-table 25 when being perforated by the blow of the perforating-pin, and this table is slotted at 26, so 100 as not to interfere with the perforating-pin.

The perforating-arm 17 is moved so as to

perforate the disk 15, and against the action of spring 23, by means of the stud 27, which is fixed to the rocker-arm 28, and is provided with the anti-friction roll 29, which moves over the upper curved end, 30, of the said arm 17. Motion is given the rocker-arm 28 through its supporting rock-shaft 31, which is rocked by the attached pawl-arm 32, over which works the stud 40, fixed on the rocker-lever 33, (see Fig. 4.) which is pivoted at 34, and is provided with the spring 35, the lower end of the lever 33 being engaged by the stud 41, fixed on the shaft 36, which is held under spring tension by the attached spring 37. This shaft 36 is provided with a handle or lever, 38, which lies to the outside of the clock-frame, as shown in Figs. 2 and 4, and this handle may be moved between the stops 39 in direction of the arrow, and then upon being released the spring 37 will force it back into normal position. It is obvious that each movement of the hand-lever 38, as described, will effect the tilting of the perforating-arm 17 on its pivot 18, through means of the intermediate connections, and that this will effect the desired perforation of the slowly-rotating record-disk 15.

To give a visual indication that the movement of the hand-lever 38 has effected the registration, I provide the dial 43, over which moves the record-hand 44 at steps equal to the black and white marginal areas on the dial. The record-hand 44 is mounted on the arbor 45, (see Fig. 4,) upon which is secured the ratchet-wheel 46, which is provided with the spring-acted retaining-pawl 47, and which is fed forward one tooth at a time by means of the engaging-pawl 48, which is pivoted on the end of the pawl-arm 32, and is provided with spring 49. The perforation of the record-disk 15 may also be accomplished through the electrical connections independently of the hand-lever 38. This is effected by the armature 50 of the electro-magnet 51, the armature being fast upon rock-shaft 31, so that the action of the armature relative to its magnet will rock the shaft 31, and thereby cause the same result as the movement of the hand-lever 38. The throw of the armature 50 is limited by the set-screw 52.

As the record-disk 15 rotates twice in twenty-four hours, it is necessary to shift the perforating-arm 17 every twelve hours, so as to punch the disk in concentric circles, as indicated in Fig. 2. The position of the perforating-arm is shifted by the cam 53, which is fixed on the shaft 54, and which engages pin 55 on the pivoted bracket 19. The cam-shaft 54 is revolved once in twelve hours by means of the ratchet 56, which is mounted thereon, and is advanced by the rotation of the wheel 57, provided with tooth 58 for engaging the teeth of ratchet 56. The shaft 59, upon which the wheel 57 is fast, may be rotated in any suitable way by the clock-train. The ratchet 56 is held from backward movement by the retaining-pawl 60.

The magnet 51 is in the local circuit 61, which is supplied with power by battery 62. This local circuit is open at the contact-fingers 63, mounted on the fixed disk or plate 68, and the circuit-closing wheel 64, which rotates with the hour-hand arbor 66 of the clock-train 10, and is provided with the cog 65. The wheel 64 is in electrical communication with the clock-frame, over which the local circuit is made, by means of its arbor 66, so that whenever the cog 65 is in contact with one of the contact-fingers 63 the local circuit will be completed at such point, and upon operation of any of the push-buttons 67 to close the circuit at the time of contact between said fingers and cog the local circuit 61 will be entirely completed, and magnet 51 will be energized, thereby drawing up its armature, which will effect the registration.

The main-line or alarm circuit 69 is fed by the battery 70, and is provided with an alarm signaling apparatus, 71, at the central office, which is supposed to be distant from where the clock and its local circuit are placed. The alarm-circuit 69 is made over the trip-lever 72, which is pivoted at 73, and over the trip-arm 74 and its contact-spring 79, which makes contact with the contact 75, forming one terminal of the alarm-circuit. The trip-arm is pivoted at 76 to the trip-lever, and is provided with the spring 77, which serves to restore the arm to normal position after being tripped by the trip-studs 78, fixed at diametrically-opposite points on the trip-disk 80, which rotates with the hour-hand arbor 66. The trip-lever 72 is held retracted against the stop 81 by means of the attached spring 82, and as the lower end of lever 72 engages the stud 83 of the rock-arm 28 the latter is held upright, thereby holding the armature 50 normally away from the magnet.

When the contact-spring 79 is closed up on contact 75 the alarm-circuit will be closed over trip-lever 72, trip-arm 74, and contact-spring 79, and the alarm 71 will inform the operator at the central station of the fact.

As the trip-disk revolves once an hour, the two trip-studs 78 will cause the trip-arm to throw the spring 79 in contact with the contact 75 once every half-hour. In Fig. 2 the trip-stud 78 is shown as having just moved against the trip-arm, and as the disk continues moving in direction of the arrow the contact-spring will be moved into contact with the contact-screw 75.

While the trip-studs are in engagement with the trip-arm 74, the tilting of the trip-lever 72 out from the trip-studs will be caused by closing the local circuit at the upper button, as it will be seen that the upper contact-finger 63 is in contact with the cog 65, thereby causing a current to pass through the electro-magnet 51, attracting the armature 50, rocking the shaft 31, to which is attached the arm 28, carrying the stud 83, which engages with the lower end of the trip-lever 72, thereby mov-

ing the upper end carrying the trip-arm 74 away from the trip-disk 80, which will obviously cause the disengagement of the trip arm and stud, and will prevent the spring 79 from closing on contact 75, thereby defeating the completion of the alarm-circuit for that half-hour.

In Fig. 2 I have shown the clock without the hand-lever 38 and as having the two push-buttons 67 in the local circuit, the manipulation of which at the proper time will effect the registration. Thus two push-buttons may be supposed to represent two different localities in the building in which the clock is situated, and as each push-button has a corresponding contact-finger, 63, it will be evident that once an hour the watchman will be required to operate each push-button to register, else the alarm-circuit will be closed and his neglect will be made known at the central station. Should the hand-lever 38 be used alone, with the construction shown, it would be necessary to operate the lever every half-hour, because of the two trip-studs 78 on the hourly-rotating trip disk 80.

It is obvious that either the manipulation of the push-buttons or the hand-lever will independently effect the rocking of the rock-shaft 31, thereby operating the rocker-arm to tilt the trip-lever in a direction away from the trip-disk and preventing the completion of the alarm-circuit.

The cog 65 of the circuit-closing wheel 64 is constructed of a size to remain in contact with the contact-finger 63 for about five minutes each, so that within that time the watchman may register and prevent the completion of the alarm circuit.

In order to warn the watchman of the approaching time—the five minutes' time within which he must register, or be informed on by the completion of the alarm-circuit—I provide a warning-bell, 84, which is sounded by the bell-tap 85, pivoted at its upper end on stud 86 and held normally under tension by spring 87. The tap is formed with a shoulder, 88, which is engaged by the trip-studs 78 in turn as they rotate. The tap is adjusted relatively to the studs, so that as one stud moves into engagement with the trip-arm 74 the opposite trip-stud will trip over the shoulder 88 of the tap and snap the tap into contact with the bell, the sounding of which warns the watchman that within the next five minutes he must register or the alarm will be given at the central station, informing the officers there of such failure on part of the watchman.

My invention contemplates the placing of a system of the registering clocks in communication with a central office or other desirable places, where notice of failure or neglect of watchmen's duty is to be signaled.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with an alarm-circuit and a moving circuit-closing device for peri-

odically acting on the alarm-circuit, of a time-recording mechanism and connections intermediate the circuit-closing device and the recording mechanism, whereby the operation of the recording mechanism may prevent the circuit-closing device from acting on the alarm-circuit and the non-operation of the recording mechanism may allow the alarm-circuit to be acted on, substantially as and for the purpose herein described.

2. The combination, with the alarm circuit and the alarm device therein, and a traveling circuit-closing device periodically acting on the alarm-circuit and a warning-bell actuated by the circuit-closing device just before the latter is to act on the alarm-circuit, of a recording mechanism and connections intermediate the said mechanism and the circuit-closing device, whereby upon the operation of the recording mechanism the circuit-closing device may be rendered inoperative upon the alarm-circuit, substantially as and for the purpose herein described.

3. The combination, with an alarm-circuit and the alarm device therein, the moving circuit-closing device periodically acting on the alarm-circuit, of time-recording mechanism and connections intermediate the said mechanism and the circuit-closing device, whereby the operation of the said mechanism may prevent the said circuit-closing device from acting on the alarm-circuit, an electro-magnet controlling the operations of the recording mechanism, and a local circuit provided with one or more circuit-closers, and including both the said electro-magnet and the said circuit-closing device of the alarm-circuit, substantially as and for the purpose herein described.

4. The combination, with an alarm-circuit having therein an alarm device, and a moving circuit closing device for periodically acting on the alarm-circuit, of recording mechanism and connections intermediate the said mechanism and the circuit-closing device, whereby the operation of the former may prevent the latter from acting on the alarm-circuit, a hand device and an electro-magnet for independently operating the recording mechanism, and a local circuit provided with circuit-closers, and including the said circuit-closing device and the said magnet, substantially as and for the purpose herein described.

5. The combination, with the alarm-circuit and the alarm device therein, and the moving circuit-closing device periodically acting on the alarm-circuit, of recording mechanism and connections intermediate the said mechanism and the circuit-closing device, whereby the operation of the former may prevent the latter from acting on the said alarm circuit, and a dial provided with a recording-hand, the said hand advanced by degrees over the dial by means of the said connections intermediate the recording mechanism and the circuit-closing apparatus, substantially as described.

6. The combination, with the alarm-circuit

and the alarm device therein, and the circuit-closing device periodically acting on the alarm-circuit, of recording mechanism and connections intermediate the said mechanism and the circuit-closing device, whereby the operation of the former may prevent the latter from acting on the alarm-circuit, a record-dial provided with a hand which may be advanced by degrees over the dial, a hand device and an electro-magnet for independently operating the recording device and advancing the recording-hand, a and local circuit provided with circuit-closers, and including both the said electro-magnet and the circuit-closing device, substantially as and for the purpose herein described.

7. The combination, with the alarm circuit and an alarm device therein, a moving circuit-closing device operated by a clock-movement for periodically acting on the alarm-circuit, and a warning-bell actuated by the said circuit-closing device just before the device is to act on the alarm-circuit, of recording mechanism and connections intermediate the said mechanism and the circuit-closing device, an electro-magnet and a hand device for independently operating the recording mechanism, and a local circuit provided with circuit-closers, and including both the said magnet and the circuit-closing device, substantially as and for the purpose herein described.

8. The combination, with a clock-train and the record-disk mounted on the arbor of the hour-hand of the clock train, of a pivoted perforating-arm for perforating the record-disk, and a rock shaft provided with a rocker-arm having a stud engaging and actuating the said perforating-arm, the pawl-arm mounted on the rock-shaft, and the spring-acted pawl mounted thereon, the record dial provided with a hand having an arbor provided with a ratchet-wheel, a retaining-pawl for said ratchet-wheel, the pawl on the pawl-arm for engaging the ratchet, a spring-acted pivoted rocker-lever provided with a pin engaging the pawl-arm, and the operating hand-lever provided with a spring-acted shaft having a stud engaging the foot of the rocker-lever, substantially as and for the purpose herein described.

9. The combination, with the clock-train having the hour hand arbor thereof provided with the record disk, of the pivoted spring-acted bracket and the pivoted spring-acted perforating-arm mounted thereon, the slotted perforating-table for the record disk, and a cam mounted on one of the arbors of the clock-train and engaging the pivoted bracket for shifting the position of the perforating-arm so that the arm may perforate the record-disk in two concentric circles each twenty-four hours, substantially as and for the purpose herein described.

10. The combination, with the clock-train and the hour-hand arbor thereof, the contact-fingers, a circuit-closing wheel provided with a cog and mounted on the said arbor and acting to

periodically make contact with the said contact-fingers, and the local circuit provided with circuit-closers and including the said contact-fingers, of a trip-disk provided with trip-studs and mounted on the said arbor and in electric communication with the said circuit-closing wheel, an alarm-circuit having an alarm device therein, a spring acted trip-lever provided with a spring-acted pivoted trip-arm and included in the alarm circuit, and a rock-shaft provided with a rocker arm for actuating the trip-lever, whereby, when the trip-studs in turn trip the trip-arm and are thereby about to close the alarm-circuit, the operation of the said tilt-lever may act to prevent such closing, substantially as and for the purpose herein described.

11. The combination, with the clock-train provided with the rotating contact-making devices and the local circuit including such devices, of an alarm-circuit having an alarm device therein, the spring-acted trip-lever provided with the spring-acted trip-arm and both included in the alarm-circuit, the said trip-arm actuated by the said contact-making devices and acting to close the alarm-circuit, the rock-shaft provided with a rocker-arm engaging the trip-lever, an electro-magnet included in the said local circuit and having the armature thereof attached to the said rock-shaft, the pawl-arm mounted on the said rock-shaft and provided with a spring-acted pawl, the record-dial and the hand therefor provided with an arbor having a ratchet-wheel engaged by the said pawl, a retaining-pawl for the said ratchet, a hand-lever having a spring-acted shaft provided with a stud, a spring-acted rocker-lever engaging the said pawl-arm and engaged by the said stud on said shaft, a second clock-train and the record-disk mounted on the hour-hand arbor thereof, a pivoted spring-acted perforating-arm, and a slotted perforating-table for the disk to rest against, the said perforating-arm engaged by the said rock-arm, whereby the recording mechanism may be operated independently by the hand-lever and the electro-magnet, thereby perforating the said perforating-disk and advancing the said record-hand on its dial, substantially as and for the purpose herein described.

12. The combination, with the spring-acted pivoted bracket and the spring-acted perforating-arm mounted on the said bracket, of an arbor of a clock-train and a disk mounted thereon and provided with a tooth, a ratchet-wheel and a cam mounted on a shaft, and the ratchet-wheel engaged by the said tooth of the wheel, the said cam engaging the bracket and acting to shift the bracket at a predetermined time in order to shift the position of the perforating-arm, substantially as and for the purpose herein described.

13. The combination, with the clock-train 11, having the arbor 12 thereof provided with the carrying-plate 13, and the record-disk 15, mounted on such plate, of the slotted perfo-

rating-table 25, the spring-acted perforating-arm 17, provided with perforating-pin 23 and pivoted on the pivoted bracket 19, the rock-shaft 31, provided with the pawl-arm 32, the
 5 feed-pawl 48, and the arbor 45, provided with hand 44, and the ratchet-wheel 46, engaged by the pawl 48 and retained by pawl 47, the dial 43 for the hand 44, the hand-lever 38, and the spring-acted shaft 36 therefor, provided with
 10 the stud 41, and the spring-acted rocker-lever 33, having the stud 40, engaging said pawl-arm 32, substantially as and for the purpose herein described.

14. The combination, with the pivoted
 15 spring-acted bracket 19 and the pivoted spring-acted perforating-arm 17 mounted thereon, of the clock-train 11 and the rotating cam 53, driven by the train and engaging the bracket 19, for shifting the same, substantially as and
 20 for the purpose herein described.

15. The combination, with the recording mechanism driven by the clock-train 11, sub-

stantially as described, of the rock-shaft 31, provided with the rocker-arm 28, the electro-magnet 51, having the armature 50 mounted
 25 on the said shaft 31, the clock-train 10, and the rotating circuit-closing wheel 64, provided with cog 65 and driven by the said train, the contact-fingers 63, engaged by said cog, and the
 30 local circuit provided with push-buttons 76, and including said contact-fingers, said magnet and said circuit-closing wheel, the alarm-circuit 69, provided with alarm apparatus 71, and having contact 75, the trip-lever 72 in the
 35 alarm-circuit, and the trip-arm and the contact-spring also in the alarm-circuit, and the trip-disk 80, provided with the trip-studs 78 and mounted on the arbor 66, substantially as and for the purpose herein described.

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Witnesses:

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