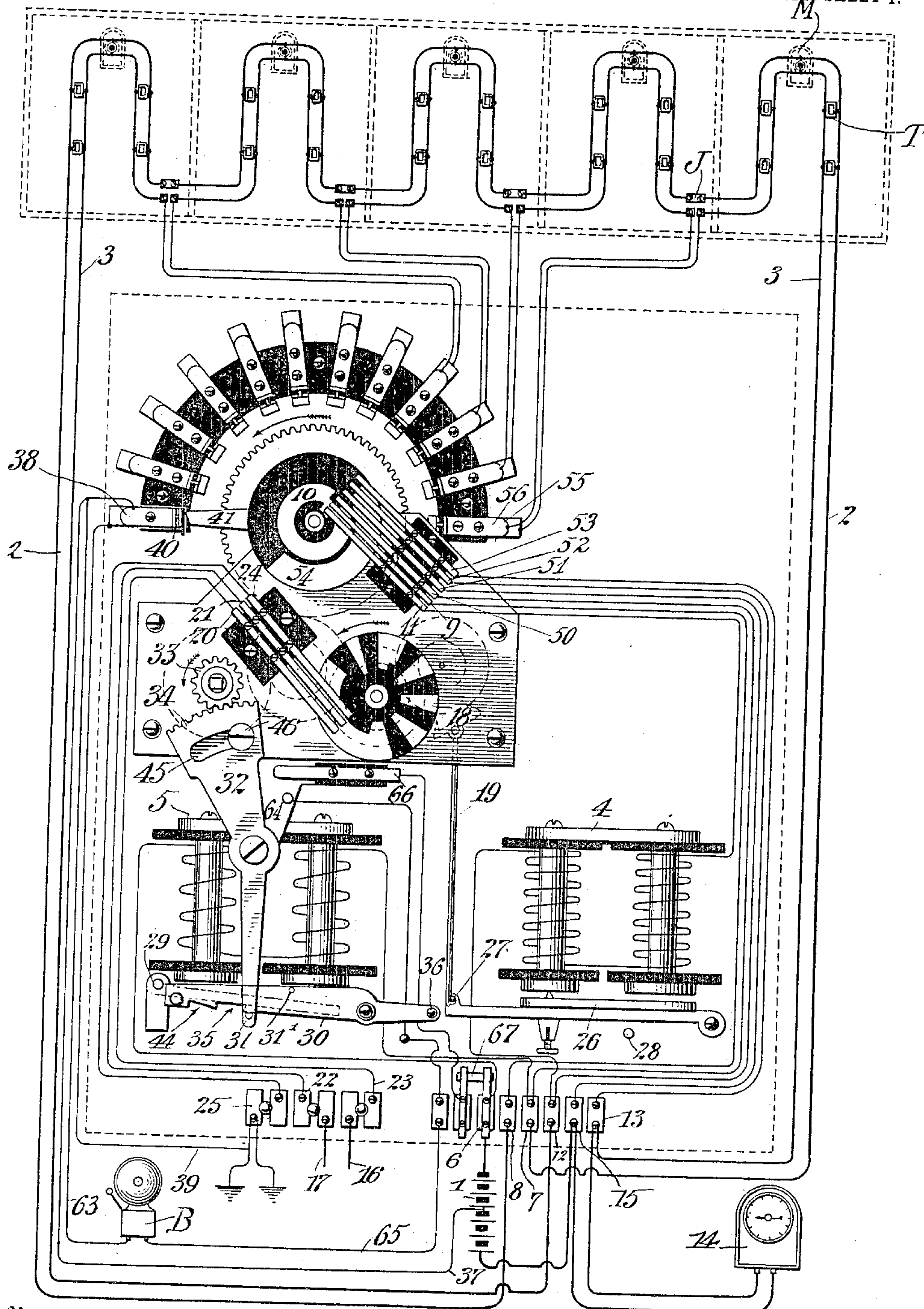


No. 819,231.

PATENTED MAY 1, 1906.

J. M. LATIMER.  
ALARM SYSTEM AND APPARATUS.  
APPLICATION FILED SEPT. 13, 1905.

3 SHEETS-SHEET 1.



Witnesses  
Hans S. Ober  
Karl S. Allen

Fig. 1.

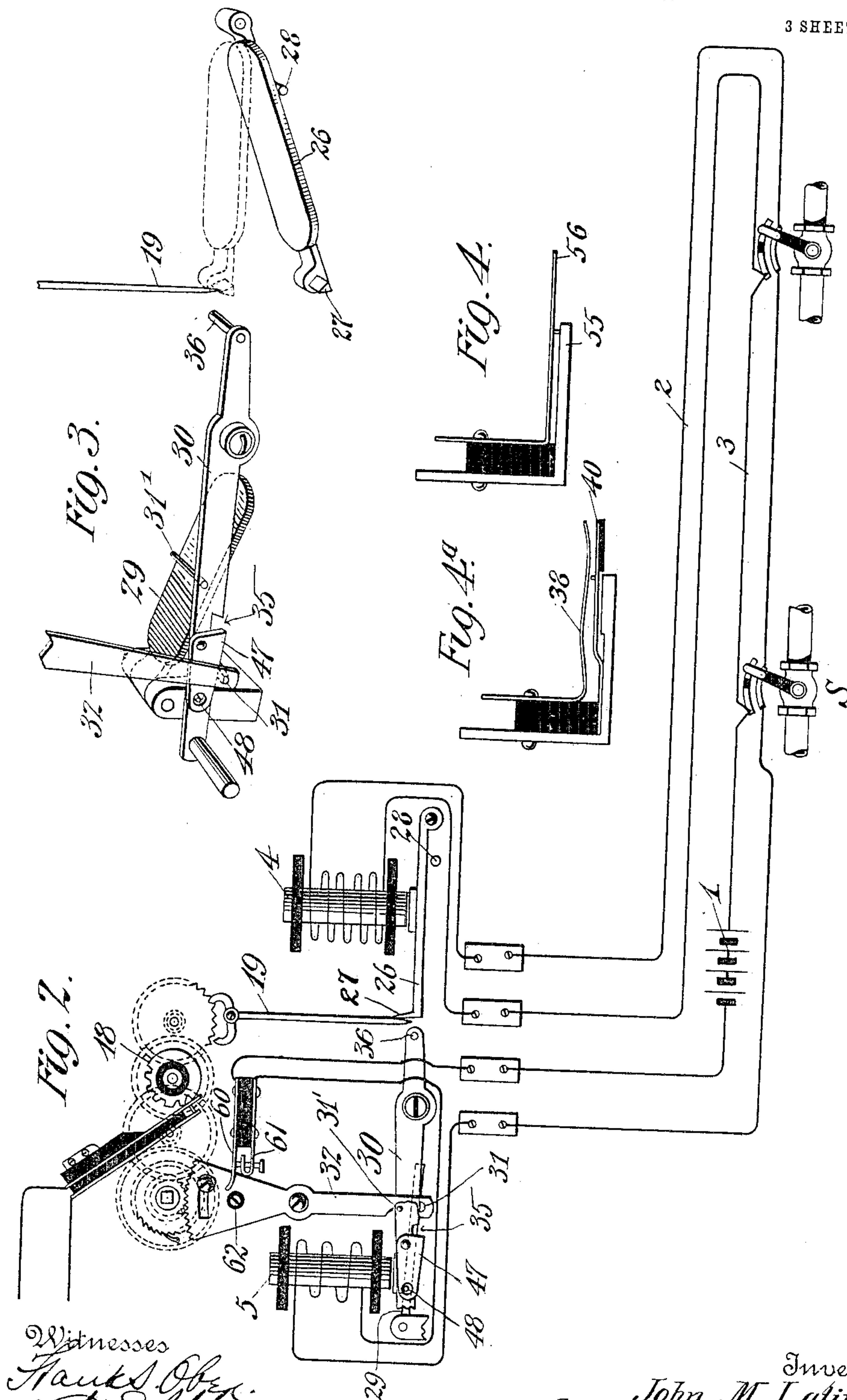
Inventor:  
John M. Latimer,  
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3 SHEETS—SHEET 2.



Witnesses  
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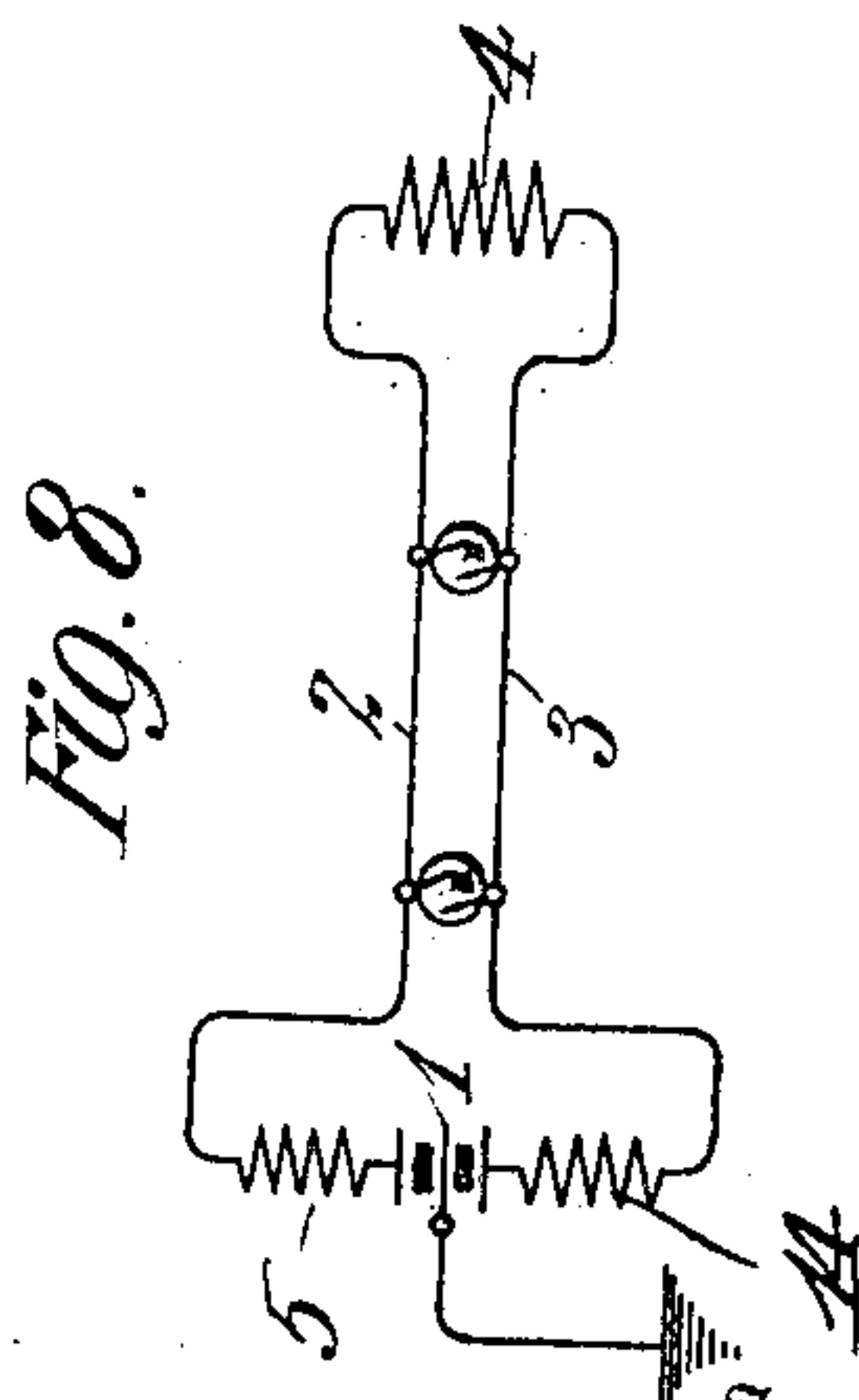
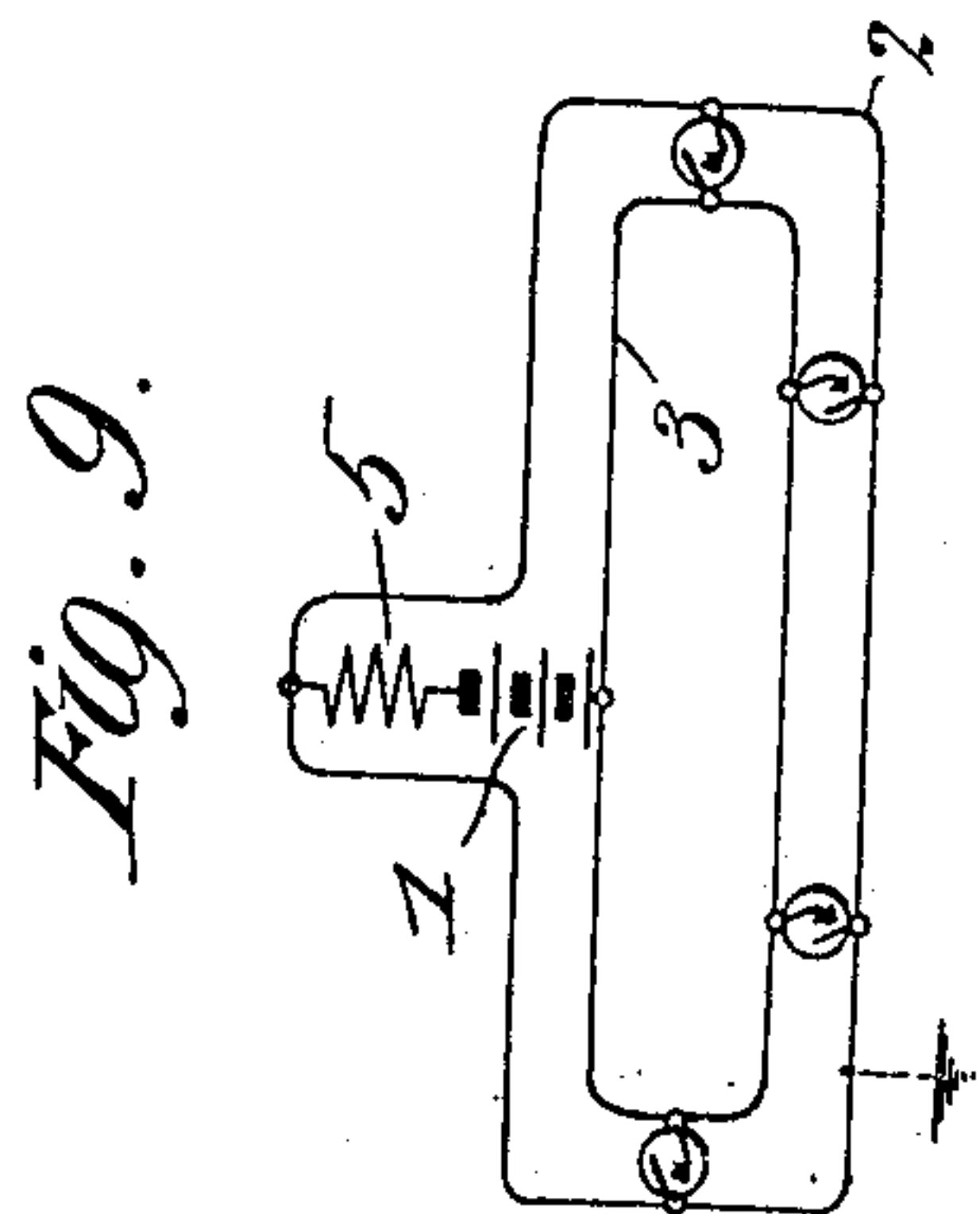
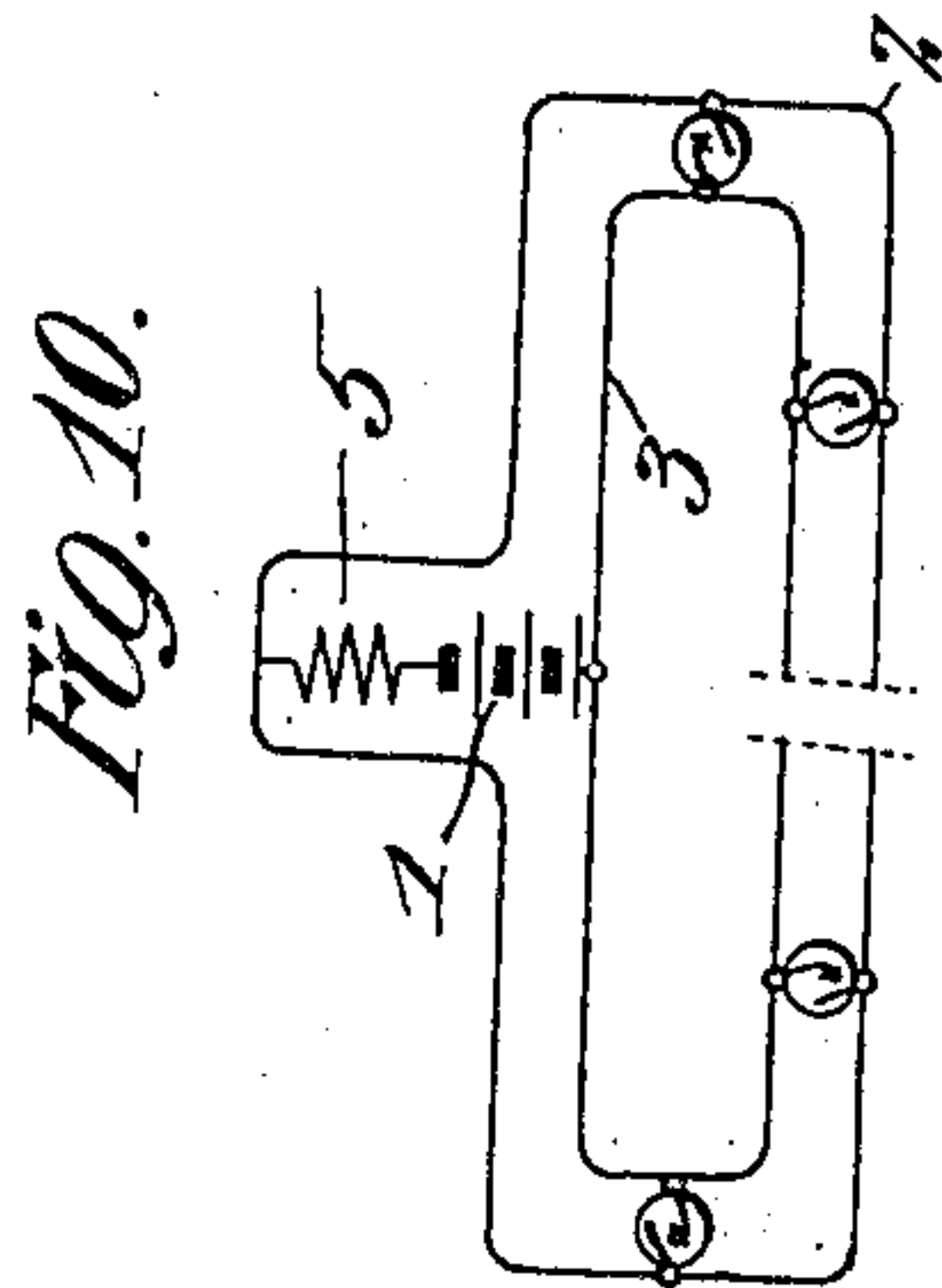
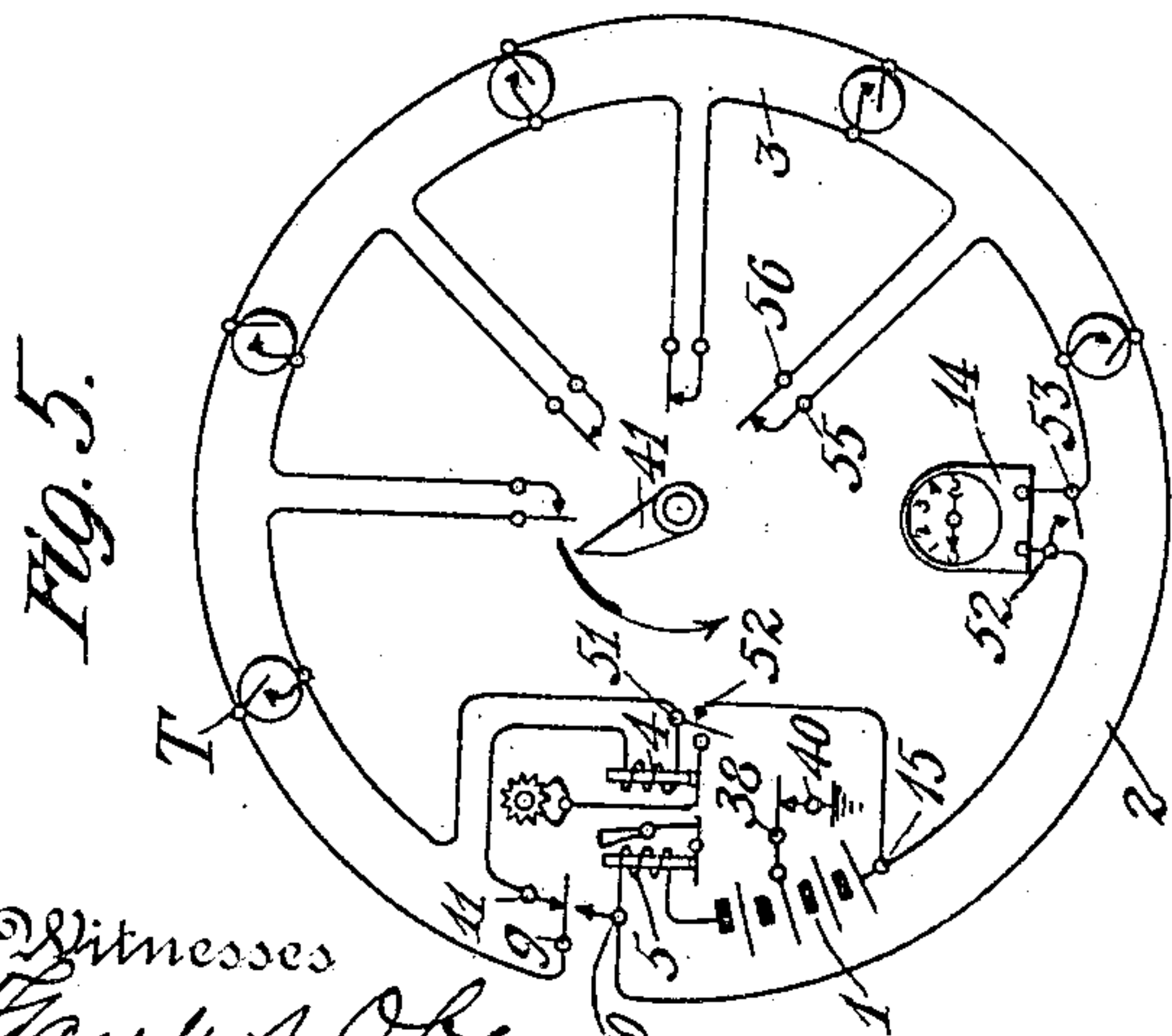
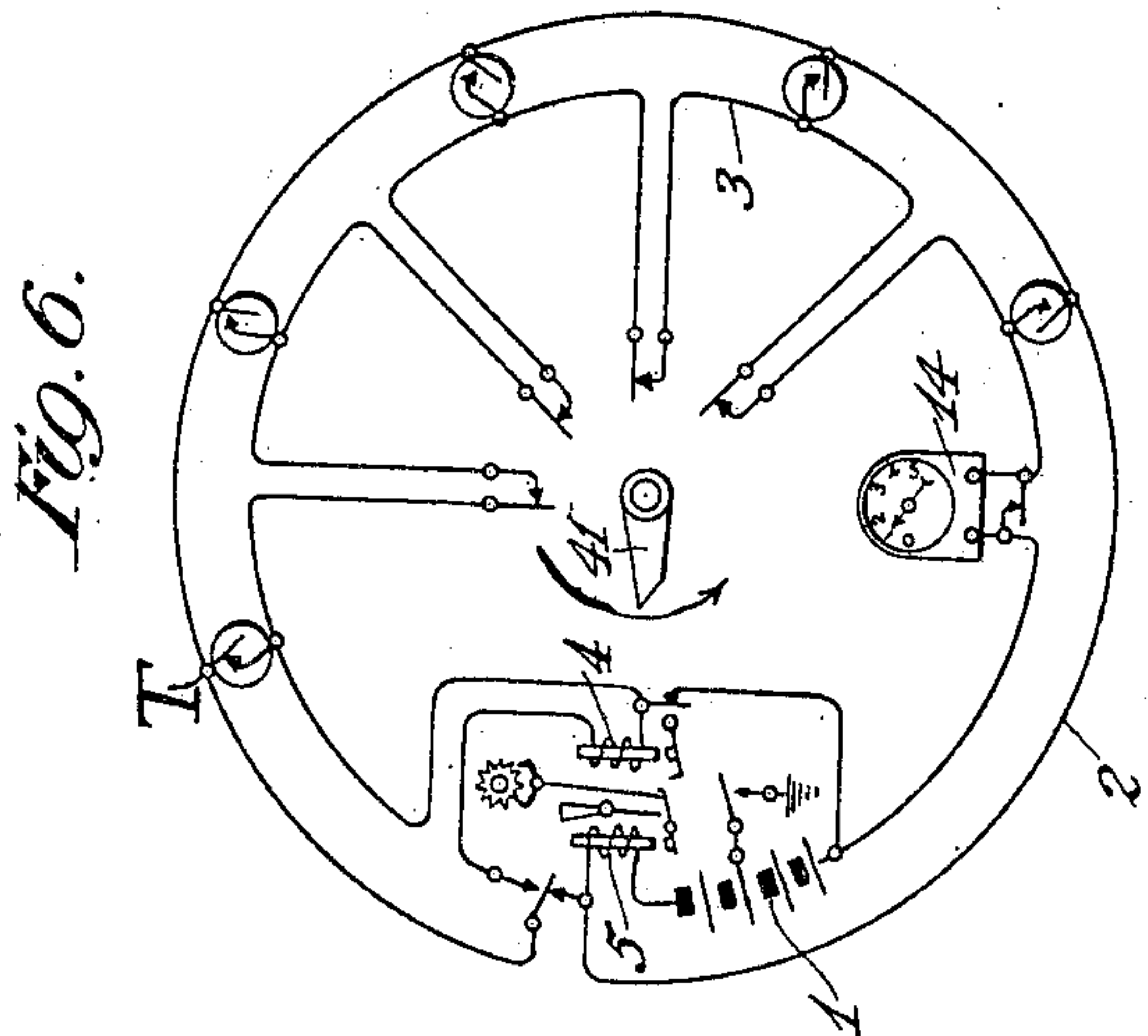
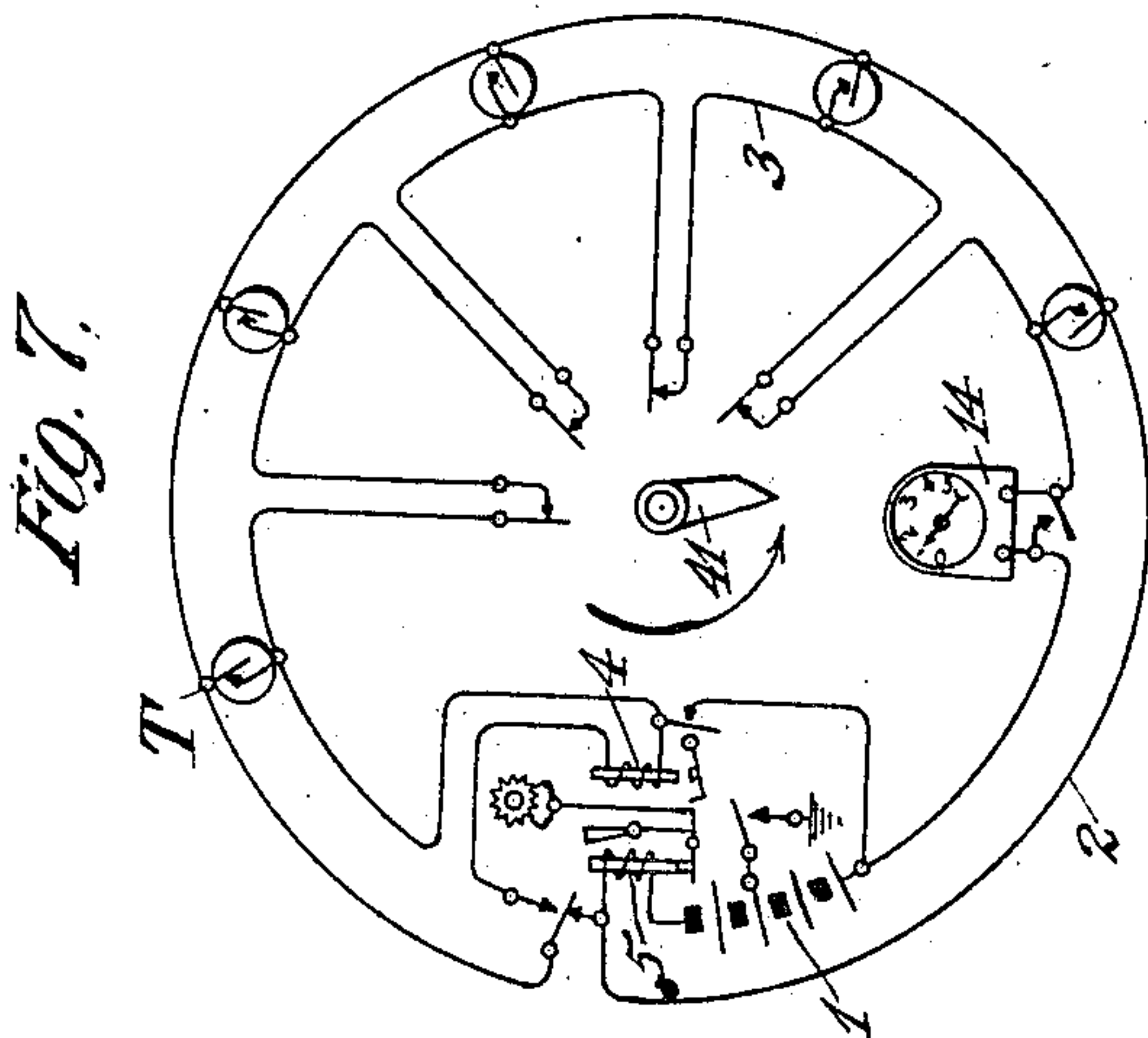


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APPLICATION FILED SEPT. 13, 1905.

3 SHEETS—SHEET 3.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## ALARM SYSTEM AND APPARATUS.

No. 819,231.

Specification of Letters Patent.

Patented May 1, 1906.

Application filed September 13, 1905. Serial No. 278,340.

*To all whom it may concern:*

Be it known that I, JOHN MORRIS LATIMER, a citizen of the United States, residing at Flushing, Queens county, New York, have  
5 invented certain new and useful Improvements in Alarm Systems and Apparatus, of which the following is a full, clear, and exact description.

My invention relates to improvements in  
10 alarm systems and apparatus, particularly apparatus controlled from a local alarm-circuit adapted to transmit alarms to headquarters.

The object of the invention is to provide a  
15 system which is always adapted to transmit all kinds of alarms to which a system may be called upon to respond and under all conditions.

The invention consists of improvements  
20 the principles of which are illustrated in the accompanying three sheets of drawings.

Briefly speaking, it may be said to comprise the employment of local circuits continuously under test from a local battery and  
25 including at one end a trouble-alarm magnet and at the other end a main alarm-signal magnet. The instrument containing the signal mechanism is connected to headquarters by the usual circuits and the system provided with the customary grounds and a  
30 suitable form of annunciator. It will all be better understood from an inspection of the following specification.

Figure 1 is a view, largely diagrammatic,  
35 of an apparatus and system embodying the improvements of my invention. Fig. 2 is a diagrammatic view of the principal parts of the apparatus mechanism and a simplified local circuit. Fig. 3 is a perspective view of  
40 the releasing and stopping mechanism for the signal-wheel and clockwork. Fig. 4 is a detail of one of the annunciator-contacts. Fig. 4<sup>a</sup> is a detail of a switch for opening a battery-ground. Fig. 5 is a diagrammatic  
45 view of a system embodying my invention with the parts of the apparatus shown in their normal position. Fig. 6 is a similar view showing the relative positions of the parts of the apparatus after a "trouble-sig-  
50 nal" has been started and it has annunciated one floor. Fig. 7 is a similar view showing the position which the parts will take upon

continued movement from the position shown in Fig. 6. Fig. 8 is a diagrammatic view simplified from that shown in Fig. 5,  
55 merely showing the circuit elements. Fig. 9 is a simplified diagram of the circuit shown in Fig. 6, one of the wires being grounded. Fig. 10 is a simplified diagram of the circuit shown in Fig. 6, the alarm having been started be-  
60 cause of simultaneous breaks in both circuits.

The main alarm instrument for the local circuit is located in a convenient place in the building or other structure that it is desired to protect by the system. A local battery  
65 1 is provided for energizing the local circuits, together with local alarm-bells and annunciator.

2 and 3 are the branches of the local alarm-  
70 circuits.

4 and 5 are electromagnets connected into the main local circuit at opposite ends, which will be called "trouble" and "alarm" magnets, respectively.

In the instrument are provided a series of  
75 terminal blocks. 6 represents one of those to which one terminal of the battery is connected. This block 6 and block 7 are connected to the winding or windings of the alarm-magnet 5. The local branch circuit  
80 2 is connected to block 7 and after passing through the entire building is connected to another block 8. From block 8 the wire leads to the brush 9.

10 is a plate of a commutator rotatable  
85 with the other parts of the clock mechanism which bridges the brushes 9 and 11, and thus establishes electrical connection with the terminal block 12 through the coils of the trouble-signal magnet 4. The other branch  
90 3 is connected to this block 12 and after passing through the entire building is connected to terminal block 13.

14 is a local annunciator connected between blocks 13 and 15. Block 15 is connected to  
95 the other terminal of the battery.

16 and 17 are terminals of the main leads of the general alarm-circuit to headquarters.

18 is the signal disk or wheel, commonly termed "break-wheel," driven by the usual  
100 clock mechanism at the proper time, but controlled by the pallet-tail 19.

20 and 21 are brushes engaging the signal-wheel and connected to the plates 22 and 23,



which are connected to the terminals 17 and 16 of the main circuit.

24 is a brush engaging the break-wheel for connecting it to ground through terminal plate 25.

The local circuit being normally energized from the battery 1, the magnet 4 holds its armature 26 up, so that the pin 27 stands in the way of the lower edge of the pallet-tail 19, and thus prevents the train from rotating. The commutator is in a position to normally ground the local circuit through the contacts 38 and 40, which are held in contact by the arm 41 of the commutator. Contact 38 is connected to the battery by lead 37, and contact 40 is connected to ground through lead 39. If one of the local mains—for instance 2—is grounded, the current flowing through the trouble-signal magnet 4 is decreased. This permits the armature 26 to fall against the stop 28. The pin 27, carried by the armature, releases the pallet-tail 19 and permits the train to rotate, so that the signal-wheel 18 is propelled and the signal caused by one rotation of the signal-wheel is sent in to headquarters. When the commutator starts to rotate, the arm 41 releases the spring-contact 40 and opens the ground through leads 37 and 39, so that the alarm-signal magnet 5 does not operate.

29 is the armature for the alarm-signal magnet 5. Only a few turns of wire are provided on magnet 5, so that with the normal current flowing there is insufficient magnetism to attract the armature 29.

30 is a pivoted lever normally held in the position shown in Fig. 1 by a pin 31, carried by the arm 32.

33 is a pinion rotated by the clock mechanism in the direction of the arrow, which meshes with a segmental gear 34 on the arm 32. When the clock mechanism operates upon the release of armature 26, the pin 31 is carried to the left beneath the notch 35 in the lever 30, permitting the lever to fall and bringing the pin 36 on its right-hand end up, thus stopping the movement of the pallet-tail 19, and consequently the clock mechanism and signal-wheel 18, so long as the magnet 5 remains deenergized.

If a thermostat or other form of circuit-closer operates to short circuit the two branches 2 and 3 after the instrument has sent in a "trouble-alarm" and the lever 30 is resting, with the pin 31 of the arm 32 in the notch 35, the current flowing through the alarm-signal magnet 5 from the battery will be suddenly increased. This will attract the armature 29, which, striking against the pin 31', carried by the lever 30, will raise the lever, release the pin 31 from the notch 35, and bring the pin 36 away from the pallet-tail 19. The clock mechanism will then again start and a fire-alarm or other complete alarm will be sent in. In this case if

both branches 2 and 3 of the local alarm-circuit remain unbroken the short circuit of the thermostat or other circuit-closer will establish a complete circuit in both directions. (See Figs. 6 and 9.) The importance of this will be readily seen, since a complete break in both branches of the circuit on either side of the circuit-closer will not affect the alarm.

The operation of the circuit-closer short-circuits the trouble-signal magnet 40, so that if a ground occurs to start the instrument and the circuit-closer operates subsequently the subsequent opening of the ground does not affect the sending in of the circuit-closer alarm. If the circuit-closer operates when the local circuit is in its normal condition, the trouble-signal mechanism 4 is short-circuited. Its armature 26 consequently drops and releases the train. At the same time the alarm-signal magnet 5 is energized by the current of the battery and its armature 29 drawn up. This strikes against the pin 31' and holds the lever 30 with the pin 36 down, permitting the entire alarm to be sent in. The operation of the trouble-signal magnet will take place no matter what happens to the local circuit, whether a ground, short circuit, or break on one or both branches. Similarly, the trouble-alarm magnet will operate upon a decrease in current strength of the battery. Any short circuit of the two branches of the local alarm-circuit will operate the alarm-signal magnet and send in a complete alarm, whether by accidental short circuit or intentional short circuit, as by a thermostat T, manual alarm M, burglar-alarm, sprinkler-alarm S, &c.

The clock mechanism or train is spring-driven and so geared that the signal-wheel revolves six times and sends in six alarms for one complete operation. "Trouble," such as a ground, momentary short-circuit, a break, or deterioration of the battery, will send in only one round or trouble-alarm. A continued short circuit will operate a "complete" alarm of six rounds. After three rounds have been sent in the instrument begins to operate the annunciator to indicate the floor of the operated circuit-closer. It is then held so that the automatic stopping mechanism cannot operate; but the train must continue to run until the annunciation is complete. The arm 32, moving with the train, carries the pin 31 beneath the shoulder 44 of the stopping-lever 30 and then holds the pin 36 out of the path of movement of the pallet-tail 19 during annunciation. The train stops when the end of the slot 45 strikes the screw 46. If a trouble only has occurred, the train stops when the pin 31 comes under the notch 35, allowing the lever to fall and the pin 36 to rise. The structure of Fig. 2 is designed to hold the "stopping-lever" after the second round has begun. With this short play in the notch 35 binding is likely to occur, so I have provided a dog 47, pivoted to the lever



30, which has a slight tilting movement, limited by the play of the pin 48 in the recess of the dog. When the pin 31 is pressed against the nose of the dog, the dog is tilted slightly. The lifting of the armature 29 by the magnet 5 will raise the lever 30, and carrying the pivot of the dog up the pin is released much easier. In this structure a momentary short circuit after a trouble-alarm will draw up the lever 30, and the nose of the dog will instantly tilt back over the pin 31 and "hold" the arm 32 so as to prevent the stopping-lever from acting until the complete round of six alarms have been sent in and the annunciation completed.

50 is a contact-finger connected to block 7, branch 2, and magnet 5, coacting with the commutator-segment 10 to close the circuit through finger 9 and the alarm-magnet 5 as soon as the train starts. Simultaneously the circuit through the trouble-magnet is operated by segment 10 between fingers 9 and 11. Contact-fingers 51, 52, and 53 are normally separated; but as soon as the commutator starts they are connected through the segment 54. Fingers 51 and 52 close the branch 3 around the trouble-magnet 4, so that both ends of branch 3 are connected to terminal 15 of battery 1. At the same time fingers 52 and 53 are connected and short circuit the annunciator 14, clearing the lines 2 and 3 of all resistance except the alarm-magnet 5, as shown in Figs. 6, 9, and 10. The annunciator being of the step-by-step type gives one-half a point indication as soon as short-circuited.

55 and 56 are contacts normally in engagement and connected in the line 3 at a junction J between the first and second floors of the building. A series of pairs of these contacts are connected into line 3 between each of the different floors and arranged on the arc of a circle around the commutator. After the first three rounds or alarms have been sent in the commutator-segment 54 opens the line 3 between fingers 51 and 52 and opens the short circuit around the annunciator through fingers 52 and 53, completing the first point or trouble indication of the annunciator and leaving the circuits, as shown in Fig. 7, ready for "floor" annunciation. When the arm 41 strikes the contact 56, it opens the circuit 3. If the short circuit which started the alarm is below the junction J, the annunciator is not affected, but its pointer remains stationary, indicating "fire" on the first floor, (the same annunciation as for trouble.) The annunciator will operate step by step as often as the circuit 3 is opened and closed by arm 41 below the operated thermostat or other circuit-closer and will remain fixed as soon as the pair of contacts connected to the floor on which the "closer" was operated is passed.

In Fig. 2 the annunciator is omitted, as it is

sometimes unnecessary in certain classes of work—as, for instance, for water-flowing alarms, as shown, for sprinkler system. In this case the local circuit through the battery is opened between contacts 60 and 61 by the projection 62, carried by the arm 32, as soon as the round has been started in order to save the battery.

The bell B in Fig. 1 is connected to battery 1 by leads 63 and 37 and to the frame 64 by lead 65. Spring 66 is connected to the battery through bridge 67, which is carried by the box-door. (Not shown.) When a trouble-signal is sent in, the arm 32 stops before reaching contact 66; but as soon as the balance of a "complete" alarm starts, the arm 32 strikes contact 66, completing the bell-circuit, and thus gives a local alarm to the people adjacent the bell. This alarm will continue until the box is opened and will be repeated when the box is closed unless the train has been rewound and the parts reset in their proper positions. To reset, the armature 26 is raised to engage the pallet-tail 19, the lever 30 is raised to release the arm 32, and the train then rewound. The winding-shaft and train are provided with a suitable clutch or ratchet and pawl connected, as is customary, so that winding does not rotate the gears of the train or the signal-wheel 18. Pinion 32 being fast on the winding-shaft does, however, return the arm 32 to its original position.

What I claim is—

1. An alarm system and apparatus including a local circuit having two branches, a battery, an "alarm-signal" magnet normally connected between the branches at one end, a "trouble-signal" magnet normally connected between the branches at the other end, a series of normally open circuit-closers arranged between the branches, and signal-transmitting mechanism controlled by said magnets.

2. An alarm system and apparatus comprising a local circuit having two branches, a battery, an "alarm-signal" magnet normally connected in said circuit at one end, a "trouble-signal" magnet normally connected in said circuit at the other end, signal-transmitting mechanism, means for releasing said mechanism controlled by said "trouble-signal" magnet, a grounded connection from said battery, and means for automatically opening said ground before the completion of a "trouble-alarm."

3. An alarm system and apparatus comprising a local circuit having two branches, a battery, an "alarm-signal" magnet between the said branches at one end of said circuit, a "trouble-signal" magnet connected between the said branches at the other end, normally open circuit-closing devices arranged in said circuit, signal-transmitting mechanism, means normally controlled by said "trouble-signal" magnet for restraining said mechanism, and automatic means for cutting said



"trouble-signal" magnet out of said circuit when said signal-transmitting mechanism operates.

4. In an alarm system and apparatus, a local circuit having two branches, a battery, an "alarm-signal" magnet normally connected in series therewith at one end of said circuit, a "trouble-signal" magnet normally in series with said circuit at the other end, normally open circuit - closing devices arranged between the branches of said circuit, normally restrained signal-transmitting mechanism, means for releasing said transmitting mechanism controlled by said "trouble-signal" magnet, and means for automatically connecting the battery and alarm-signal magnet between the ends of the branches, with the branches in parallel and the "trouble-signal" magnet cut out, when the transmitting mechanism operates.

5. In an alarm system and apparatus, a local circuit having two branches, a battery, a "trouble-signal" magnet, and an "alarm-signal" magnet normally in series therewith, normally restrained signal-transmitting mechanism, means controlled by said "trouble-signal" magnet for releasing said transmitting mechanism, and means for automatically cutting out said "trouble-signal" magnet and arranging the two branches of the circuit in parallel when said signal-transmitting mechanism is released.

6. An alarm system and apparatus comprising a local circuit having two branches, a battery, a "trouble-signal" magnet, an "alarm-signal" magnet and an annunciator normally in series therewith, circuit-closers arranged between said branches, signal-transmitting mechanism, a series of pairs of contact-points, normally closed and connected in one branch of said circuit, means for releasing said signal-transmitting mechanism upon the disturbance of the normal condition of said "trouble-signal" magnet, means for automatically cutting out said annunciator when said signal-transmitting mechanism is released, means for opening and closing the circuits through said contact-points while the signal-transmitting mechanism is in operation, and means for subsequently cutting in said annunciator when the "alarm-signal" magnet is operated.

7. In an alarm apparatus, terminals for a local circuit, a "trouble-signal" magnet, an armature normally attracted thereby, signal-transmitting mechanism normally restrained by the said armature, an arm moving with said transmitting mechanism, a lever normally held thereby adapted to be released and stop said transmitting mechanism when said arm has moved a given distance, and an "alarm-signal" magnet and an armature therefor adapted to move said lever to release the transmitting mechanism when said

"alarm-signal" magnet is sufficiently energized.

8. In an alarm apparatus, terminals for a local circuit, a "trouble-signal" magnet, an armature normally attracted thereby, signal-transmitting mechanism normally restrained by the said armature, an arm moving with said transmitting mechanism, a lever normally held thereby adapted to be released and stop said transmitting mechanism when said arm has moved a given distance, an "alarm-signal" magnet and an armature therefor adapted to move said lever to release the transmitting mechanism when said "alarm-signal" magnet is sufficiently energized, a local bell, a battery, and means for automatically completing a circuit through said bell when said transmitting mechanism has partially operated.

9. In an alarm system and apparatus, a local circuit having two branches, two magnets and a battery normally connected in series in said circuit, signal-transmitting mechanism, armatures for said magnets, one of said magnets normally attracting its armature to restrain said mechanism, and the other magnet being adapted to attract its armature to prevent the stopping of said mechanism.

10. In an alarm system and apparatus, a local circuit having two branches, two magnets and a battery normally connected in series in said circuit, signal-transmitting mechanism, armatures for said magnets, one of said magnets normally attracting its armature to restrain said mechanism, and the other magnet being adapted to attract its armature to prevent the stopping of said mechanism, and means for short-circuiting the magnet whose armature is normally attracted.

11. An alarm system and apparatus comprising a local circuit, a battery therefor, alarm-transmitting mechanism, a normally energized "trouble-signal" magnet having an armature normally restraining said mechanism, an "alarm-signal" magnet, means moving with said mechanism to stop it automatically after a "trouble-alarm" signal has been sent, and a normally retracted armature controlled by said "alarm-signal" magnet for releasing said stopping means.

12. An alarm system and apparatus comprising a local circuit, a battery therefor, alarm-transmitting mechanism, a "trouble-signal" magnet having an armature normally restraining said mechanism, an "alarm-signal" magnet, means moving with said mechanism to stop it automatically after a "trouble-alarm" signal has been sent, an armature controlled by said "alarm-signal" magnet for releasing said stopping means, and means for automatically opening the battery-circuit when a complete alarm has been sent in.



13. In an alarm apparatus, signal-transmitting mechanism, a trouble-signal magnet, an armature normally attracted thereby and restraining said mechanism, an arm moving  
5 with said transmitting mechanism, a lever normally held thereby and adapted when released to stop said transmitting mechanism, a dog carried by said lever having a limited tilting movement relative thereto and acting as  
10 an abutment to said arm, an "alarm-signal" magnet and an armature therefor adapted when attracted to raise said lever and permit said dog to tilt beneath the end of said arm.

14. An alarm apparatus comprising "trouble"  
15 ble" and "alarm" signal magnets, arma-

tures therefor, signaling transmitting mechanism normally restrained by the armature of the "trouble-signal" magnet, means for stopping said mechanism when released, means controlled by the armature of the other magnet  
20 for again releasing said transmitting mechanism, a commutator for controlling the connections of the local circuit, and means for stopping said transmitting mechanism and commutator with the commutator in its original  
25 position.

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It is hereby certified that in Letters Patent No. 819,231, granted May 1, 1906, upon the application of John Morris Latimer, of Flushing, New York, for an improvement in "Alarm Systems and Apparatus," an error appears in the printed specification requiring correction, as follows: In line 95, page 3, the reference numeral "32" should read 33; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 15th day of May, A. D., 1906.

[SEAL.]

F. I. ALLEN,  
*Commissioner of Patents.*