

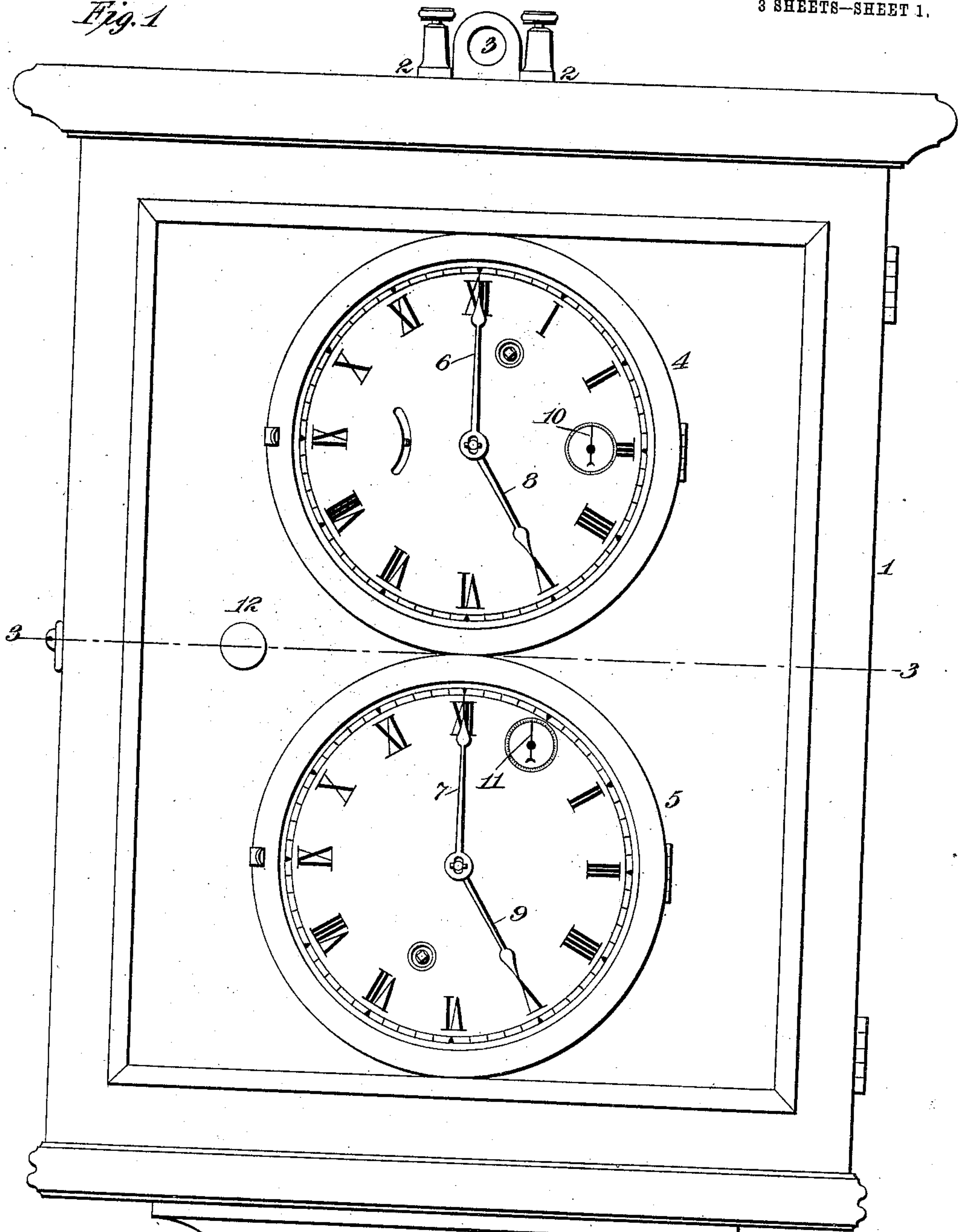
No. 826,719.

PATENTED JULY 24, 1906.

J. M. GARDINER.
TIMING MECHANISM FOR ENGINE HOUSES.
APPLICATION FILED FEB. 10, 1905.

3 SHEETS—SHEET 1.

Fig. 1



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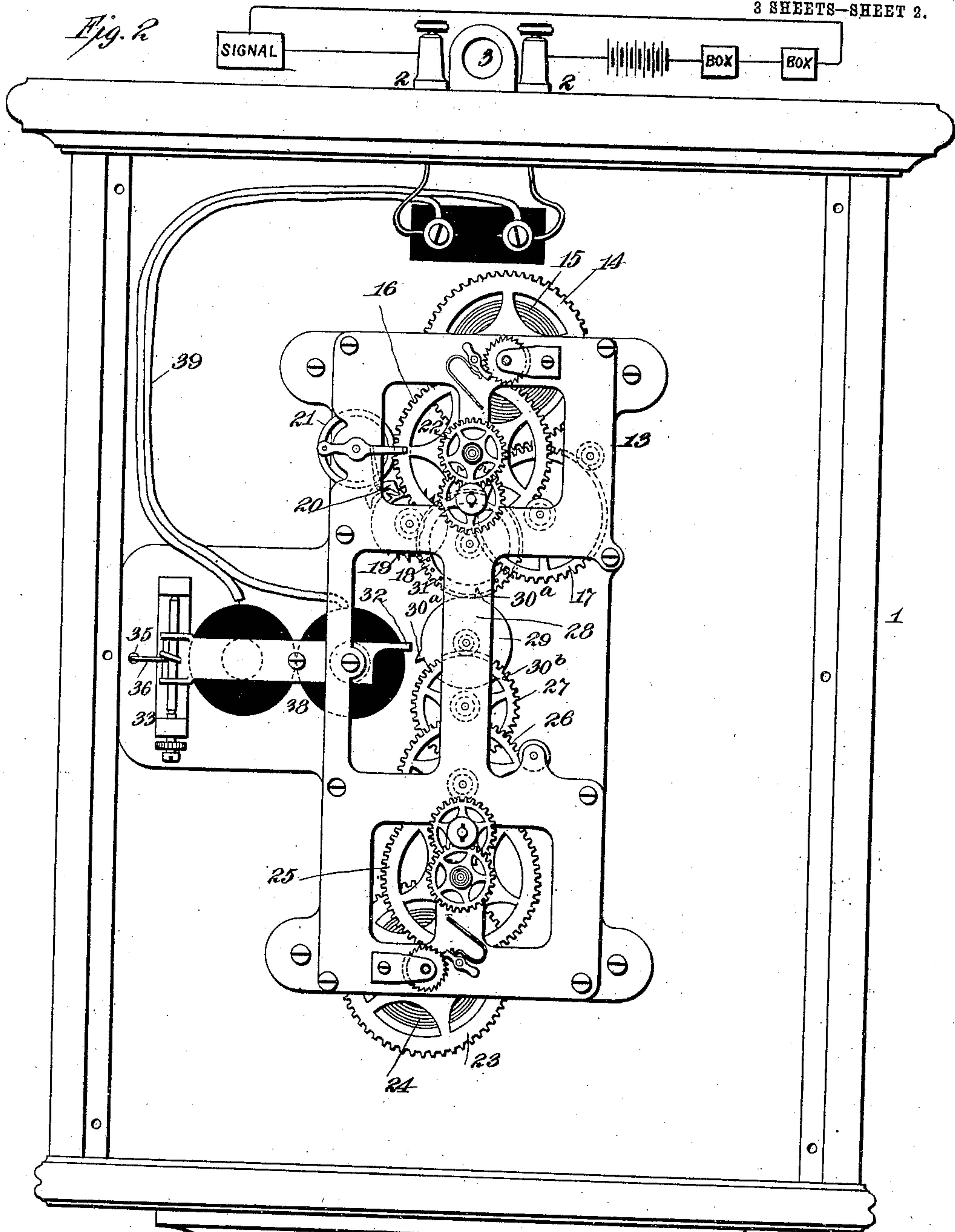
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 3

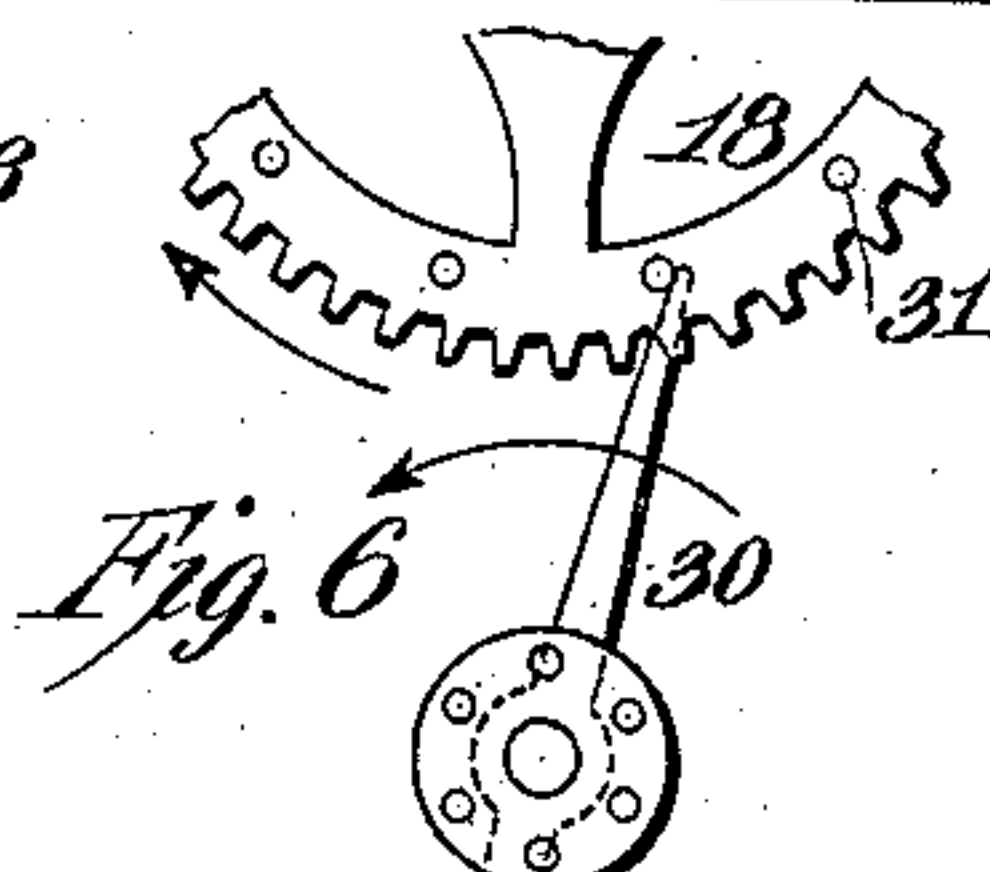
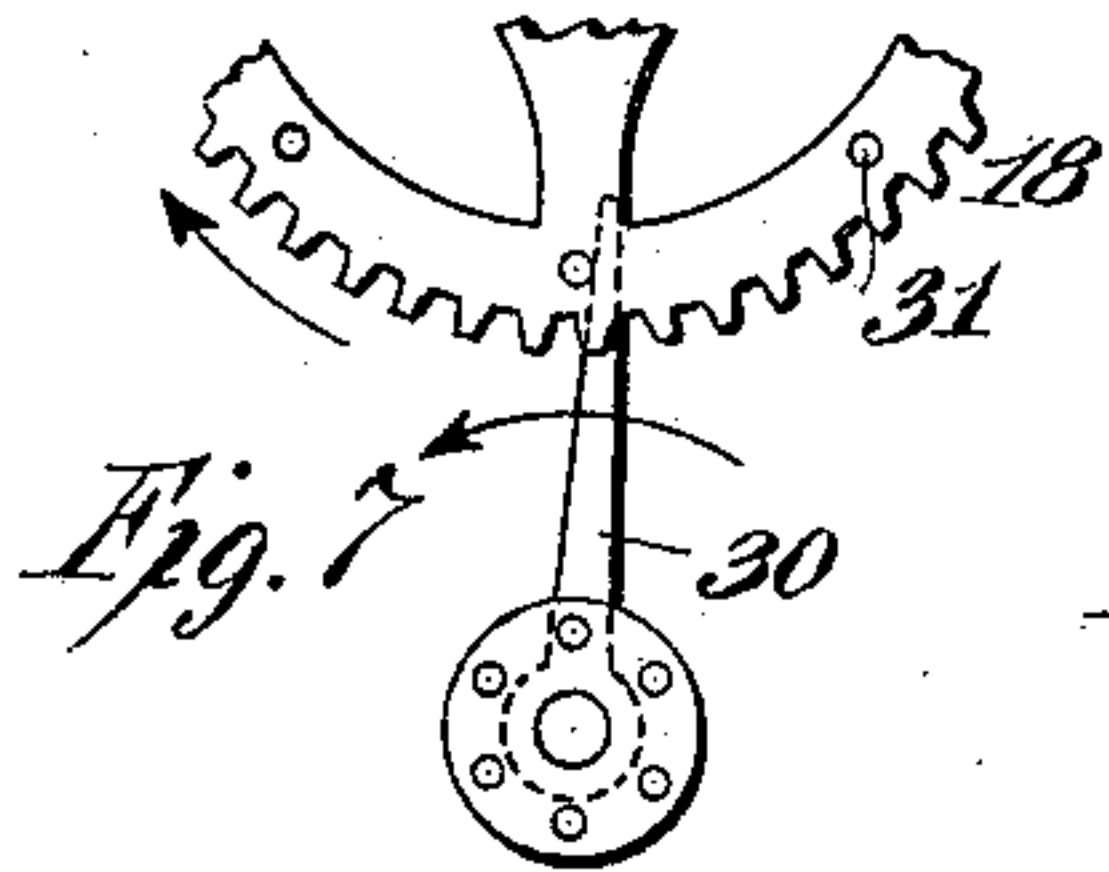
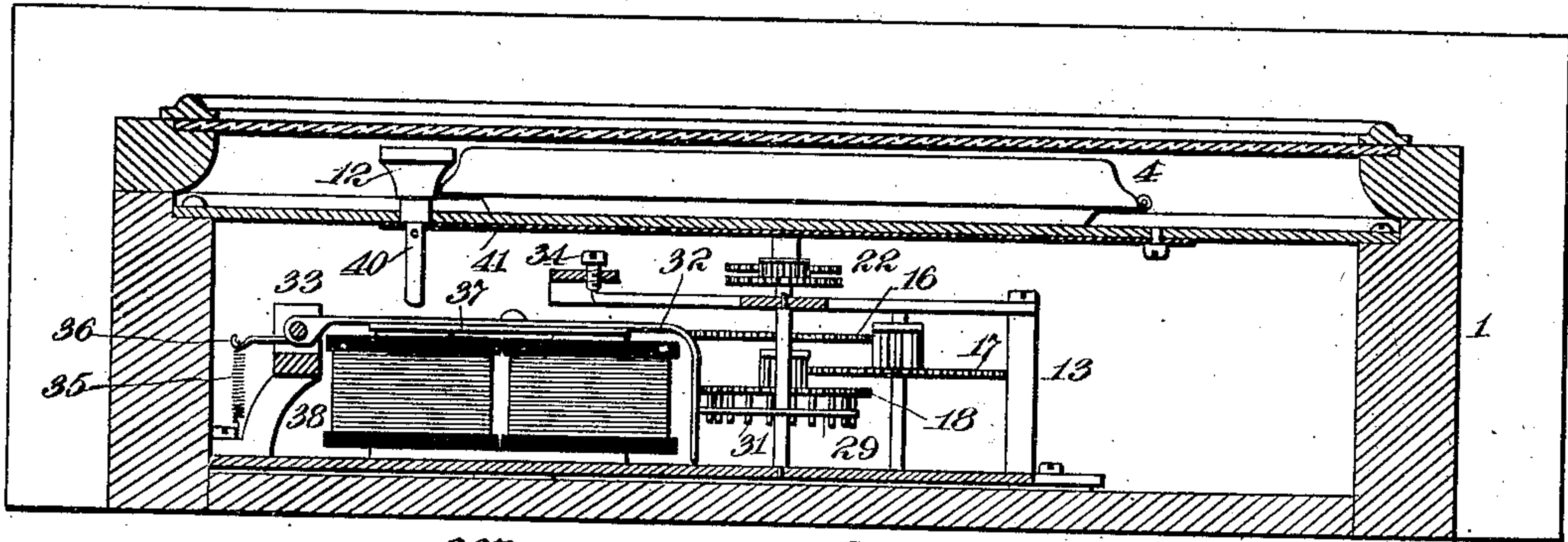


Fig. 4

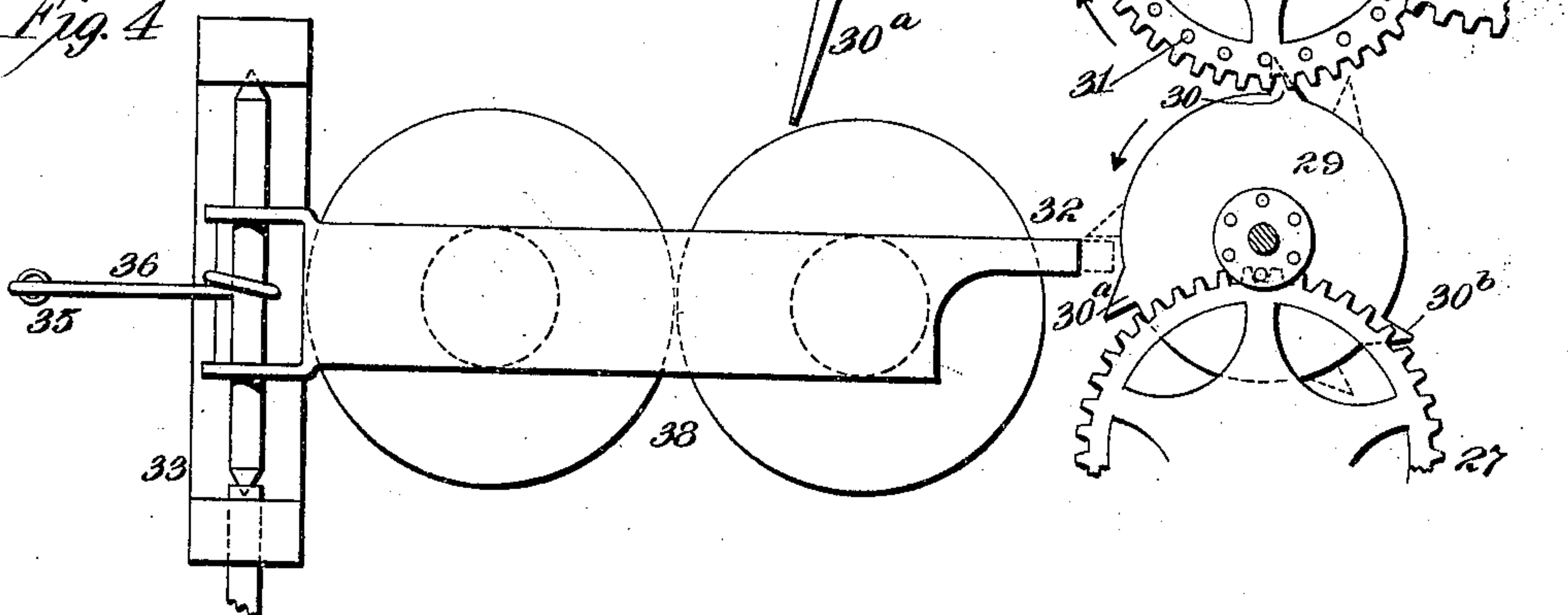
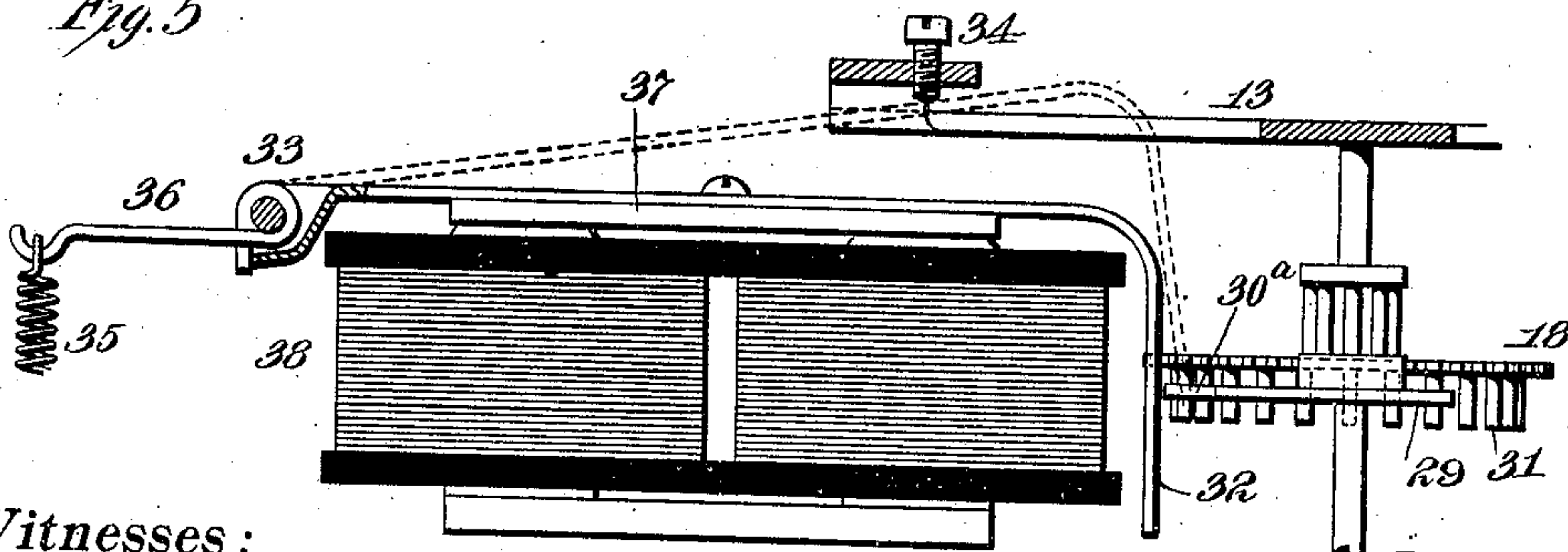


Fig. 5



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UNITED STATES PATENT OFFICE.

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TIMING MECHANISM FOR ENGINE-HOUSES.

No. 826,719.

Specification of Letters Patent.

Patented July 24, 1906.

Application filed February 10, 1905. Serial No. 245,067.

To all whom it may concern:

Be it known that I, JAMES M. GARDINER, a citizen of the United States, residing in Hackensack, Bergen county, State of New Jersey, have invented certain new and useful Improvements in Time-Indicators for Fire-Engine Houses and the Like, of which the following is a specification.

The object I have in view is the production of a device which may be placed in engine-houses and will indicate the time when an alarm is received and will also indicate the duration of time the men are absent from the house after the receipt of an alarm. Heretofore without such a device there has been no means to indicate in the separate engine-houses the exact time an alarm is received, as the firemen are too hurried to have an opportunity to make a note of the position of the hands of the engine-house clock. An indication of the time in which the men go to the fire and the time they return is of use in making a record of fires and calls.

I attain the objects of my invention by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front view of a device embodying my invention. Fig. 2 is a similar view showing the dials removed. Fig. 3 is a sectional view on the lines 3 3 of Fig. 1. Fig. 4 is an enlarged front view of a portion of the mechanism and the releasing-magnet. Fig. 5 is a side view thereof. Figs. 6 and 7 are details of modifications.

In all the views like parts are designated by the same reference characters.

In carrying out my invention I provide a clock mechanism which may be of the ordinary type and which will be constantly running and indicate the time by the usual hands and dial. In connection with this clock mechanism will be a second mechanism, also carrying hands and having a dial. The second mechanism will be controlled by the first, so that the two sets of hands may move synchronously, and the same time will be simultaneously indicated upon both dials. The means by which the two mechanisms are connected is arranged to be thrown out of gear by disconnecting mechanism, so that the mechanisms will be disconnected and the second mechanism will stop. This disconnecting mechanism is actuated by means con-

trolled by the signal-circuit and embraces, preferably, a magnet the armature of which controls the disconnecting mechanism. A manual resetting device is provided. The parts are so arranged that as soon as a signal is received the disconnecting mechanism is actuated and the second time mechanism stopped. The position of its hands will indicate the exact moment that the signal was received, and the indication will be automatically secured. As soon as the men return from the fire the difference in time between the two sets of hands on the different dials can be noted, which difference will indicate the time they have been absent from the house. The second set of hands may then be turned forward to indicate the same time as those of the first and the disconnecting device reset, whereupon the two sets of hands will continue to move synchronously, and the apparatus will be ready to respond to other signals.

With this general explanation of my invention I will proceed to describe in greater detail the particular mechanism used for carrying it out.

As shown in Fig. 1, the mechanism may be inclosed within a case 1, having binding-posts 2 2 and a supporting-eye 3 at the top. On the front of the case are arranged the dials 4 5, each being like an ordinary clock-casing, and they are provided with minute-hands 6 7, hour-hands 8 9, and seconds-hands 10 11, although the latter are not essential. A knob 12 is used to control the mechanism for resetting the disconnecting mechanism.

Referring to Fig. 2, is seen a metal frame 13, which is secured to the back of the case 1 and carries bearings for the arbors of the two clock mechanisms or movements. The movement which actuates the hands 6 and 8 comprises a great wheel 14 and the usual spring 15, a second wheel 16, connected to the hour-hand 8, a third wheel 17, a fourth wheel 18, an escapement-wheel 19, an escapement 20, and balance-wheel 21, all of the usual type and arranged as is customary in a clock. The usual minute-hand gear 22 is provided for turning the minute-hand at the proper rate.

The second movement comprises a great wheel 23, an actuating-spring 24, a second wheel 25, a third wheel 26, and a fourth

wheel 27. The fourth wheel, as shown, instead of having its arbor placed close to the second wheel, as is the case with the first movement, is carried upon the piece 28 of the frame 13 and is therefore removed a considerable distance from the other arbors. As shown in the drawings, the arbors of the second, third, and fourth wheels are arranged upon a straight line. This is in order to separate the two movements as much as possible, so that the size of the dials may be larger than if this arrangement were not used.

The connecting means comprises the following mechanism: In place of the usual escapement-wheel on the second movement is a wheel 29. This wheel is mounted upon an arbor with a pinion, the leaves of which engage with the teeth of the fourth wheel 27. As shown in the drawings, the wheel 29 is provided with three teeth 30 30^a 30^b. The number of teeth may be varied as desired. These teeth are arranged to successively engage pins 31, arranged in series and carried upon the fourth wheel 18. The teeth 30 30^a 30^b are so proportioned in relation to the pins 31 that as the fourth wheel 18 is turned the teeth 30 30^a 30^b will be successively released as the wheel 18 is turned by its mechanism in the direction of the arrow and will permit the rotation of the wheel 29. The wheel 18, with pins 31, constitutes an escapement for the second movement.

As shown in Figs. 2 and 4, the two movements, so far as their first, second, third, and fourth wheels and their pinions are concerned, are identical as to number of teeth. Consequently if the two fourth wheels rotate at the same rate of speed the hands of the two movements will turn synchronously. The two fourth wheels will rotate at the same rate of speed unless disconnected, as will be described. This will be apparent by the following explanation, reference being directed to Fig. 4: The fourth wheels 18 and 26 each have forty-eight teeth. The pinion of the arbor of the wheel 29 is provided with six leaves. Consequently this wheel will make eight revolutions to one of the fourth wheel. The wheel 29 is provided with three teeth 30 30^a 30^b, which engage with the pins 31, which latter are twenty-four in number. Consequently if the fourth wheel 18 makes a complete revolution the wheel 29 will rotate eight times and rotate the fourth wheel 27 once. It is obvious that the number of the teeth on the wheel 29 may be increased or diminished provided the pins 31 on the wheel 18 are properly proportioned.

The disconnecting mechanism comprises a moving member in the form of an angle-lever 32, which is hinged at 33. The hinge is in the form of a bar having pointed extremities, which engage with cups, one of which is formed upon a screw, so as to be adjustable, thus giving a rigid joint to prevent lateral

movement of the lever. When moved to the position shown in full lines in Figs. 4 and 5, its free end will be clear of the path of the teeth 30 30^a 30^b. The lever when clear of the path of the teeth 30 30^a 30^b will be in the neutral position. When elevated, as shown in dotted lines in Fig. 5, it will be in the active position and within the path of these teeth and will serve as a means to arrest their movement and prevent rotation of the wheel 29, the released tooth striking against the lever. A set-screw 34 serves to limit the outward movement of the lever, while a spring 35, connected to an arm 36, tends to normally move the lever to the dotted-line position unless otherwise prevented.

An armature 37 is attached to the lever 32, so as to move therewith. Behind the armature is arranged a magnet 38. This magnet is connected by wires 39 to the binding-posts 2 2. To these binding-posts are connected two ends of the signal-circuit 40, so that the magnets will be in series therewith. The signaling device used in connection with this embodiment of my invention will be operated from a closed circuit, so that the magnets 38 will be energized, except when a signal is being received. When an open-circuit signal system is employed, the mechanism will have to be modified accordingly. The lever 32, and with it the armature, when moved to the dotted-line position and in contact with the set-screw 34 will be out of the attractive influence of the magnet—that is to say, the armature will be so far away from the magnet and the spring 35 will be so powerful that the armature will not be attracted by the magnet when energized.

The resetting device comprises a pin 40, connected to the button 12 and carried by a spring-support 41, attached to the front of the case. This spring-support normally holds the pin 40 away from the lever 32, but by flexion permits the button 12 and pin 40 to be depressed to engage the latter with the lever 32 and move it against the tension of the spring 35 into contact with the magnets, where it will remain if the magnets are energized.

The operation of the device is as follows: The springs of the two movements are kept wound. The movement which comprises the wheels 14, 16, 17, and 18 will by its escapement and balance-wheel actuate its hands in the usual manner to correctly indicate the time. The second movement will be actuated by its spring and the speed of the train controlled by means of the teeth 30 30^a 30^b of the wheel 29, successively engaging with the pins 31, as previously described. The second movement will therefore turn synchronously with the first so long as the disconnecting device is in neutral position. This will be possible only so long as the circuit remains closed. The hands of the two move-

ments are set to accurately register the same time. Upon a signal being received the magnets will be deenergized and the armature released. This will cause the lever 32 to be re-
 5 tracted by the spring 35, moving to the active position and holding the armature so far away from the magnet that when the circuit is again closed during the impulses of the signal the armature will not be attracted. The
 10 movement of the lever 32 from the neutral to the active position will throw its free end into the path of the teeth 30 30^a 30^b, and the next time one of these teeth is released by a pin 31 it will strike such lever and prevent further
 15 rotation of the second movement. The lever 32 will hold the tooth in such a position that the other teeth on the wheel 29 will not engage with any of the pins 31. Therefore the first movement will be free to turn as before.
 20 After the men return from the fire the device may be reset by pressing the button 12, which will return the armature into place against the magnet, the latter then being energized. This movement will free the wheel 29. Be-
 25 fore resetting the device the difference in time indicated upon the two dials will designate the time which the men have been absent. After this is noted the hands of the second movement may be reset to agree with
 30 those of the first movement and the device will be ready to receive another signal.

It is to be noted that the second movement does not serve as a drag to retard the first, but having its own spring the fourth wheel of
 35 the first movement will act the part of an escapement to the second movement. Instead of the wheel 29 the teeth 30 30^a 30^b may be in the form of two bars secured to the arbor, as shown in Fig. 6, in which case the wheel 18
 40 will have eight pins, or a single bar 30 may be used, as shown in Fig. 7, in which case the wheel 18 will be provided with sixteen pins.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with a signal-circuit, and two independently-driven time-indicating connected movements, one movement being controlled by the other, and means for
 50 disconnecting the movements, the said disconnecting means being controlled by the signal-circuit.

2. The combination with two independently-driven time-indicating connected
 55 movements, one movement being controlled by the other, and means for disconnecting the movements, the disconnecting device being magnetically actuated.

3. The combination with two time-indicating connected movements, one of such move-
 60 ments being actuated by an escapement con-

trolled by the other movement, and a moving member which may rest within the path of the escapement, and disconnect the movements, the said member being controlled by
 65 a magnet.

4. The combination with two independently-driven time-indicating connected movements, one movement being controlled by the other, a magnetically-controlled dis-
 70 connecting device, and means for resetting the disconnecting device.

5. A device of the character described, having two dials, hands thereon, and separate independently-driven movements for
 75 actuating the hands, in combination with a signal-circuit and magnetic means controlled thereby for arresting one movement, and allowing the other one to continue.

6. A device of the character described
 80 having a continuously-driven movement, one of the wheels thereof having pins thereon, and a second independently-driven movement, having an escapement adapted to engage with the pins, the arbors of the escapement-
 85 wheel, fourth wheel and third wheel being upon substantially a straight line, whereby the two movements will be separated and large dials employed.

7. In a device of the character described,
 90 the combination with two independently-driven movements, each having a dial and time-indicating hands, the said movements being adapted to move synchronously, of means for receiving a signal, and means actu-
 95 ated by such signal-receiving means for stopping one of the movements.

8. In a device of the character described, the combination with two independently-driven movements, each having a dial and
 100 time-indicating hands, connections between the two movements whereby one will be controlled by the other and will move synchronously, of means for receiving a signal, and means actuated by such signal-receiving
 105 means for disconnecting the movements and stopping one of them.

9. The combination with a signal-circuit, and a continuously-operated time-indicating movement, of an independently-driven time-
 110 indicating movement controlled by the continuously-operated movement, and means for disconnecting the movements, the said disconnecting means being controlled by the signal-circuit.

This specification signed and witnessed
 this 9th day of February, 1905.

JAMES M. GARDINER.

Witnesses:

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