

F. LIVINGSTON.
CLOCK SETTING DEVICE.
APPLICATION FILED JULY 8, 1910.

979,402.

Patented Dec. 20 1910.

4 SHEETS—SHEET 1

Fig. 1.

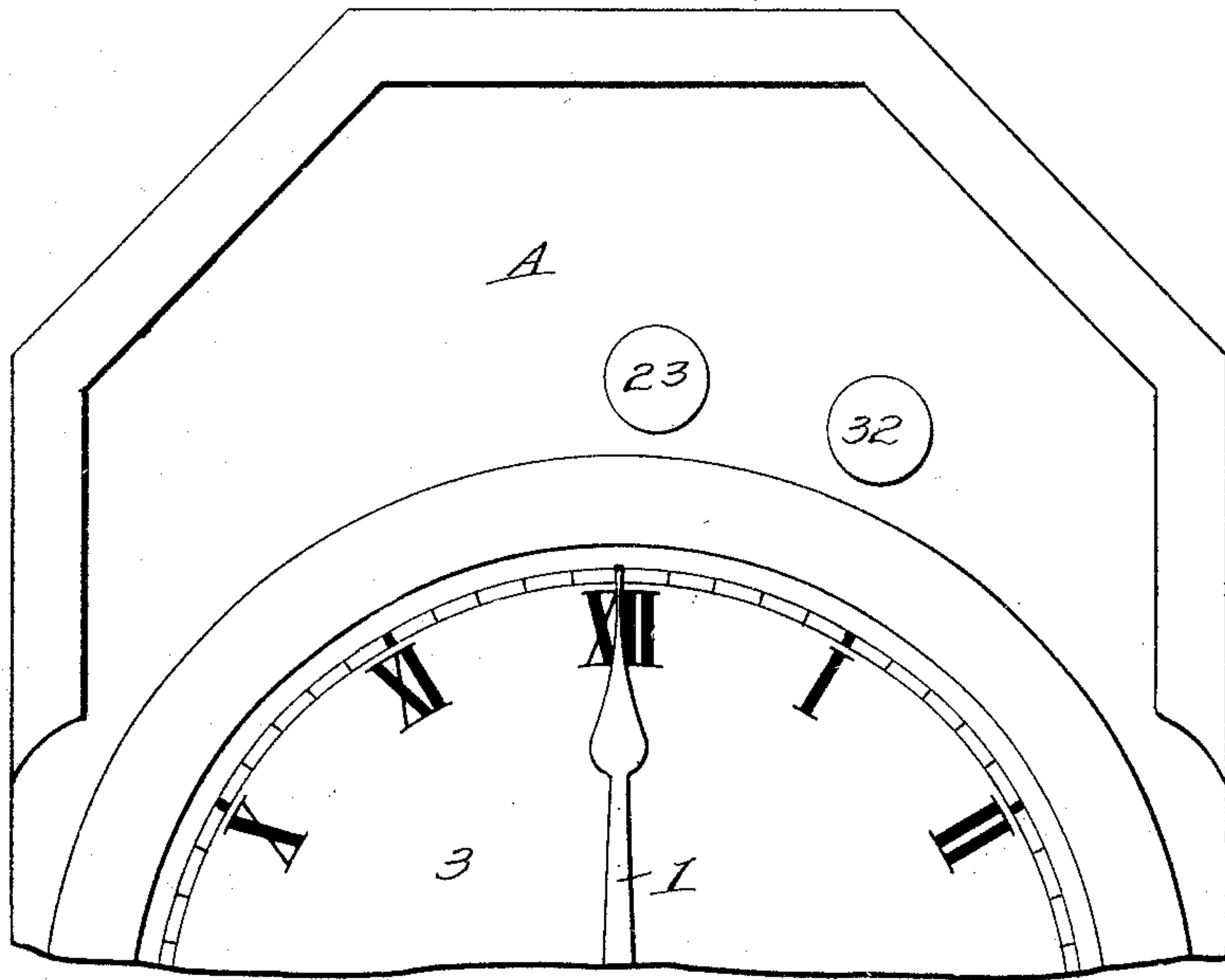


Fig. 4.

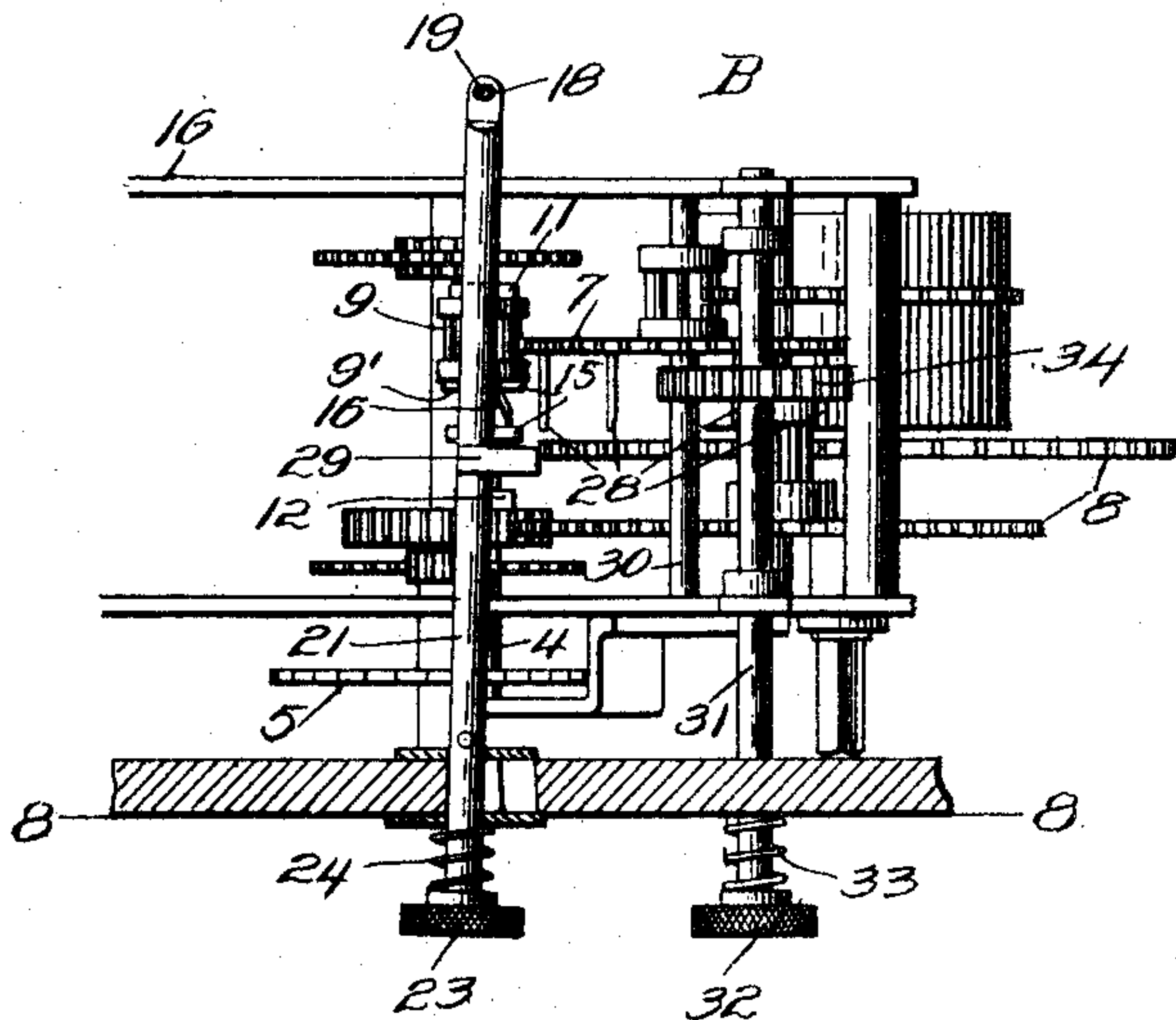
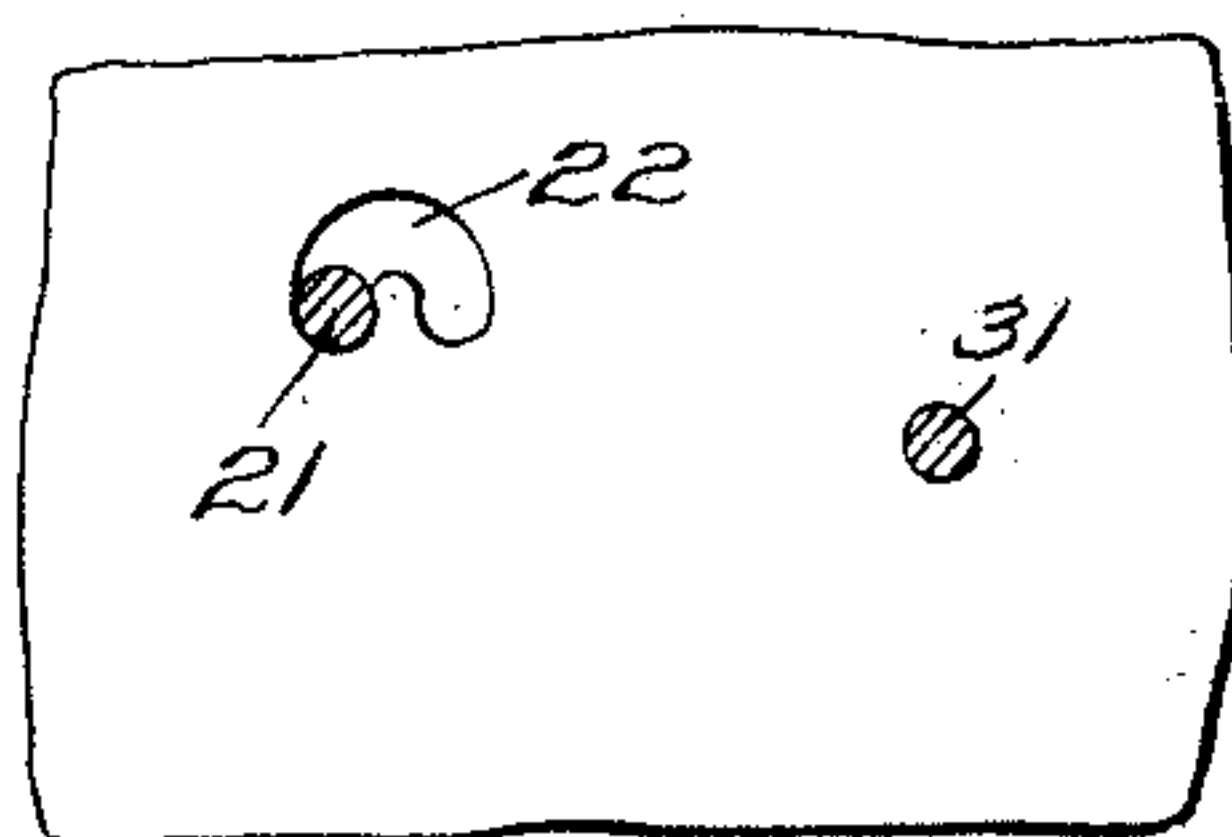


Fig. 5.



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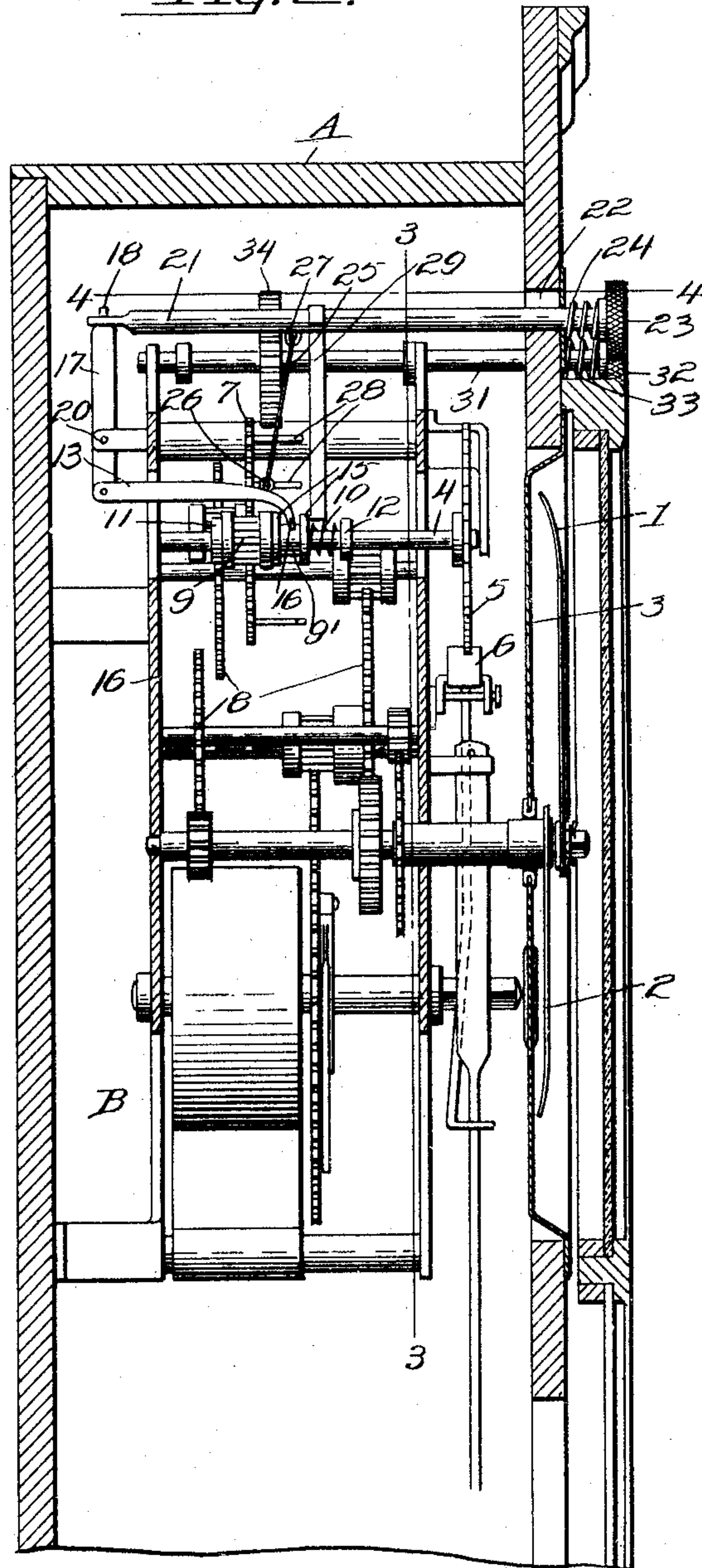
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4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 3.

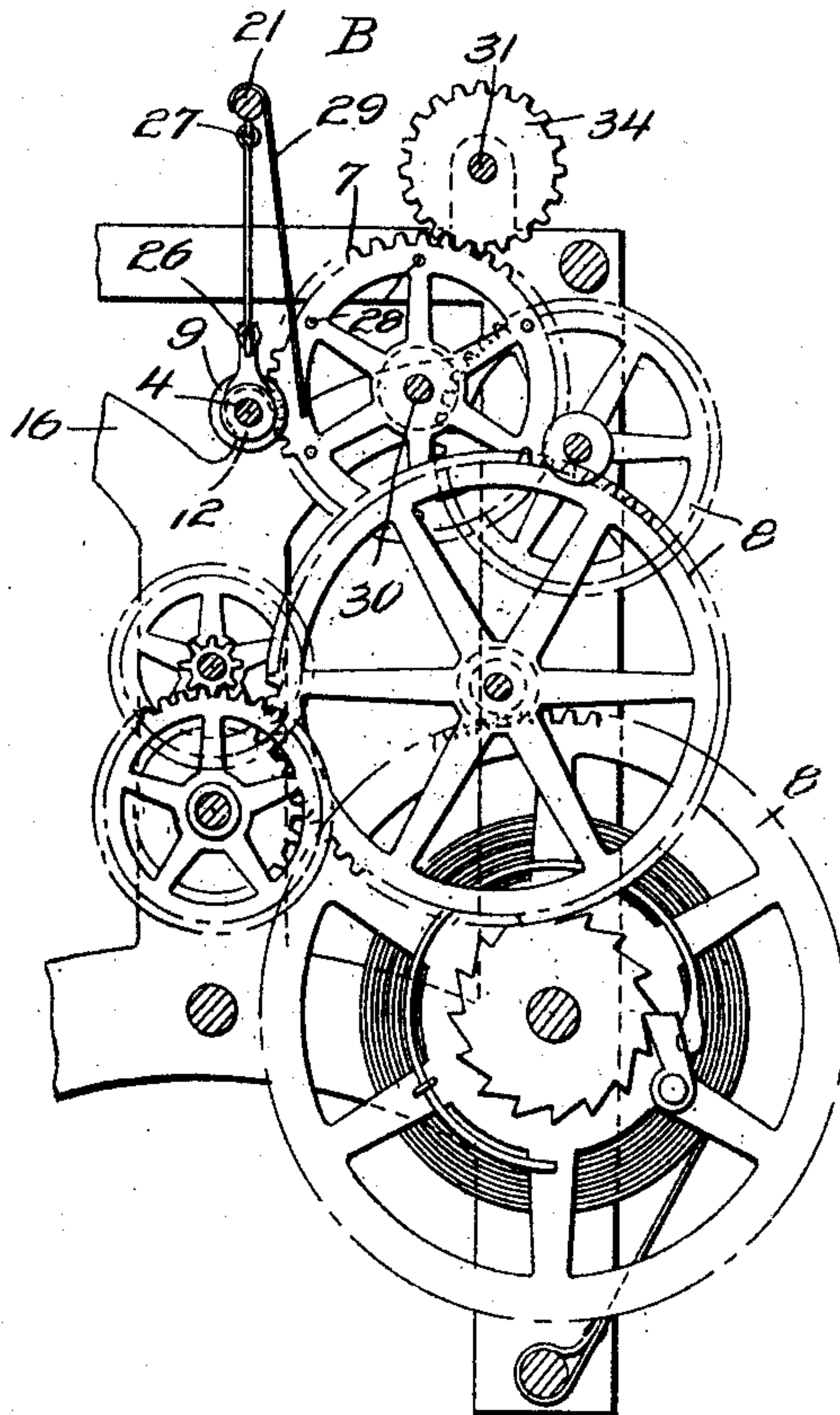
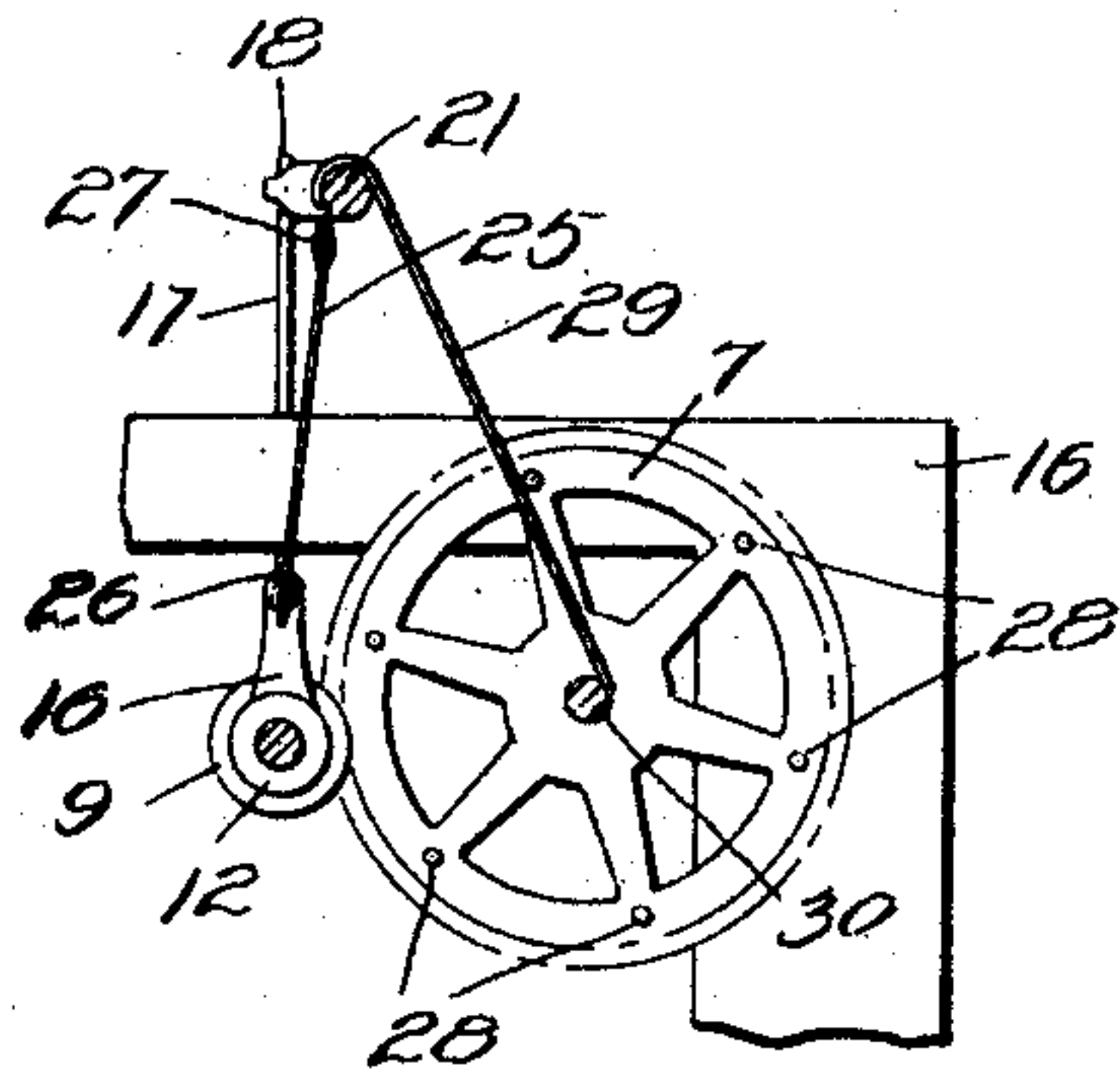


Fig. 7.



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UNITED STATES PATENT OFFICE.

FRANK LIVINGSTON, OF NEW BOSTON, ILLINOIS.

CLOCK-SETTING DEVICE.

979,402.

Specification of Letters Patent.

Patented Dec. 20, 1910.

Application filed July 8, 1910. Serial No. 570,993.

To all whom it may concern:

Be it known that I, FRANK LIVINGSTON, a citizen of the United States, residing at New Boston, in the county of Mercer and State of Illinois, have invented new and useful Improvements in Clock-Setting Devices, of which the following is a specification.

This invention relates to a clock setting mechanism, whereby the hands of the clock can be set without opening the door of the case.

The invention has for one of its objects to provide a novel clock setting mechanism which is of comparatively simple and inexpensive construction, reliable and efficient in use, and readily manipulated.

Another object of the invention is the provision of a device for effecting the forward setting of the hands in such a manner that the hands can quickly turn to a position closely approximating the correct time and can thereafter be turned step by step until the hands are accurately set.

A further object of the invention is the provision of novel means for the backward setting of the hands when they have been turned too far, or when the clock is running fast.

With these objects in view, and others, as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate one embodiment of the invention, Figure 1 is a partial front view of a clock showing the position of the hand-setting buttons. Fig. 2 is a vertical section of the clock showing the time mechanism with a setting attachment applied. Fig. 3 is a vertical section on line 3—3, Fig. 2. Fig. 4 is a horizontal section on line 4—4, showing the clock mechanism in plan. Fig. 5 is a perspective view of the parts that constitute the setting attachment. Fig. 6 is an enlarged sectional view of the means for clutching and unclutching the pinion of the escapement shaft. Fig. 7 is a sectional view of the setting mechanism in use for setting the hands minute by minute. Fig. 8 is a sectional view on line 8—8, Fig. 4.

Similar reference characters are employed

to designate corresponding parts throughout the several views.

Referring to the drawings, A designates the case of a clock in which is mounted any suitable clock works, designated generally by B, and having minute and hour hands 1 and 2 that travel over the dial 3. The clock mechanism is provided with the usual escapement shaft 4 carrying an escapement wheel 5, with which coöperates an escapement 6, and this shaft is driven by a wheel 7 that is in turn driven by a train of gears 8 of the clock mechanism. On the escapement wheel shaft 4 is a pinion 9 of the lantern type with which the teeth of the wheel 7 mesh, and this pinion is loose on its shaft and is adapted to be clutched or unclutched with respect thereto. For this purpose, a sleeve 9' is arranged on the shaft 4 and backed by a spring 10 which presses the sleeve and also the pinion rearwardly, so that the pinion will frictionally engage a collar 11 fixed on the shaft 4. The spring 10 surrounds the shaft and bears against a collar 12 fixed on the latter.

The pinion is adapted to be released from the escapement when the hands of the clock are to be set and to do this, a device 13 is employed, which has a forked end 16 straddling the sleeve 9 and engaging between the flanges 15 thereof. This device 13 passes through the rear plate 16 of the frame of the clock mechanism, and on this rear plate is fulcrumed at 20 a lever 17 which is pivotally connected with the device 13. The lever 17 has on its upper end a pivot stud 18 that loosely extends through an opening 19 in a push rod 21 that extends through an opening 22 in the front of the casing where it is equipped with the push button 23 and between this push button and the front of the clock case is a compression spring 24 that causes the push rod 21 to return to normal position when the button 23 is released after being pressed. By pushing inwardly on the button 23, the device 13 is shifted forwardly and releases the sleeve 9' from the pinion 9 so that the same will be freed from the collar 11 and unclutched from the escapement shaft 4, although the pinion will remain in mesh with the wheel 7. The forward portion of the device 13 is supported by a link 25 hingedly connected at its lower end 26 to the said device and at its upper end 27 to the bar 21. When the

pinion is thus released, the gears of the clock mechanism are free to turn under the tension of the clock spring or weights, since the escapement mechanism is thereby rendered inoperative. In order to prevent the turning of the clock hands too quickly when the pinion is thus released, a brake device is employed for retarding the movement and this device takes the form of a plurality of forwardly extending pins 28 on the wheel 7, with which a brake shoe in the form of a spring 29 engages when the bar 21 is pressed rearwardly by the push button 23. As shown in Fig. 2, the said spring shoe 29 is disposed out of the path of the pins 28 so that the operation of the clock will not be interfered with, but when the push button 23 is pushed for the purpose of setting the clock hands ahead, the spring 29 is moved into the path of the pins or pegs 28 on the wheel 7, while the escapement pinion 9 is being released from the shaft 4. While the finger is held on the push button 23, the movement of the hands is observed and as soon as the hands reach the proper position, the push button is released so that the pinion 9 can re-clutch the shaft 4 and thus bring the escapement device into operation, the brake shoe 29 being, of course, at the same time removed from the brake pins 28 when the push button is released.

If the forward setting of the clock hands cannot be accurately obtained by the forward setting device, just described, the movement of the hands can be arrested by releasing the push button 23 when the minute hand is almost at the proper point. For accurate setting, the push button and bar 21 can be moved from the position shown in Fig. 3 to that shown in Fig. 7, the opening 22 being in the form of a slot so as to provide for this movement. By laterally shifting and slightly turning the push button in this manner, the brake spring will be disposed with its free end over and bearing on the staff or shaft 30 of the wheel 7, as shown in Fig. 7. The push button, while the bar 21 is sealed in the right end of the slot 22, can now be pressed inwardly to unclutch the pinion 9 from the escapement shaft 4, but the wheel 7 can turn a distance equal to that between two adjacent pins 28, and is then arrested by the spring 29 which will not yield because its free end bears on the shaft 30. The pressure on the push button is then released so that the spring will expand and cause the pinion of the escapement to again clutch the shaft 4. The push button is again pressed inwardly and strikes the tooth with which it previously engaged, but passes along the opposite side thereof or in the space between the flat tooth and the succeeding one and during this movement of the push button, the pinion 9 is unclutched so that the wheel 7 will turn

another step, the turning of the wheel being, of course, caused by the clock spring or weight. By this repeated pressing and releasing of the push button, the wheel 7 can be turned step by step and thus bring the minute hand up to the proper point. In order to permit the spring to engage the proper sides of the pins 28, the latter may be beveled at their forward extremities. With a forward time setting means of this character, it is possible to roughly set the hands by pressing inwardly on and holding pressed the push button when the same is in the position shown in Fig. 3 or its bar 21 is in the left end of the slot 22, until the hands are approximately in the right position, and then accurately adjust the hands by the repeated pressing and releasing of the push button when the latter is in the position shown in Fig. 7.

For effecting the reverse setting of the hands, a separate device is employed. This consists of a combined rotary and longitudinally-movable bar 31 suitably mounted on the clock frame and having on its forward end a push button 32, behind which is a spring 33 that urges the bar 31 forwardly. On this bar is a gear wheel 34, the teeth of which are adapted to mesh with the teeth of the wheel 7 when the push button 32 is pressed inwardly. While the push button 32 is held pressed inwardly, it is turned so as to cause the wheel 34 to rotate the wheel 7, and thus shift the hands of the clock and while this operation is intended primarily for the backward setting of the clock hands, it is possible to set the hands forwardly if desired without using the button 23. When the push button 32 is released, the wheel 7 is free from the wheel 34 so that the normal operation of the clock will not be interfered with. In turning the clock hands by the button 32, the pinion 9 will slip around between the sleeve 9' and collar 11, while the escapement 6 holds the shaft 4 from turning with the pinion.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

What I claim as new and desire to secure by Letters Patent is:—

1. The combination of a clock mechanism including an escapement shaft, a pinion mounted on the shaft, a gear permanently

meshing with the pinion, means for clutching and unclutching the pinion to and from the shaft, means for yieldingly holding the pinion clutched to the shaft, a device for
 5 moving the pinion to unclutched position, said device consisting of a push rod, a lever mounted on the clock frame and connected with the rod, and means between the lever and pinion for shifting the latter.

10 2. The combination of a clock mechanism including an escapement shaft, a pinion thereon, means for normally clutching the pinion to the shaft, and means for unclutching the pinion, said latter means consisting
 15 of a spring pressed element, a lever connected with the element, and means between the lever and pinion for releasing the latter.

3. The combination of a clock including an escapement shaft, a pinion mounted
 20 thereon, a gear permanently meshing with the pinion, a clutch for connecting the pinion with the shaft, a spring for holding the clutch closed, and means for releasing the pinion against the tension of the spring for
 25 opening the clutch.

4. A clock-setting mechanism including an escapement shaft, a pinion slidably mounted on the shaft, a gear meshing with the pinion, means for clutching the pinion to the shaft,
 30 a spring for holding the pinion in clutched position, a push rod extending into the case, a lever connected with the rod, a member hingedly connected with the lever and arranged to unclutch the pinion by acting
 35 against the tension of the spring, and a link connected with the member and with the said rod.

5. The combination of a clock case, a clock works mechanism mounted therein,
 40 said mechanism including an escapement shaft, a pinion slidably mounted on the shaft, a gear meshing with the pinion, means for clutching the pinion to the shaft, a spring for holding the pinion in clutched
 45 position, a push rod extending into the case, a lever connected with the rod, a member hingedly connected with the lever and arranged to release the pinion by operating against the tension of the spring, a link con-
 50 nected with the member and with the said rod, a push button on the outer end of the rod, and a spring interposed between the button and clock case for operating through the rod for holding the said member released
 55 from the pinion.

6. In a device of the class described, the combination of an escapement wheel shaft, a pinion adapted to be clutched to and unclutched from the shaft, a wheel meshing
 60 with the pinion and operatively connected with the hands of a clock for setting the same, a brake for the wheel, and means for setting the brake when the pinion is unclutched to prevent free rotation of the
 65 wheel.

7. In a device of the class described, the combination of an escapement wheel shaft, a pinion adapted to be clutched to and unclutched from the shaft, a wheel meshing with the pinion hands, and means for oper-
 70 atively connecting the hands with the said wheel for setting the hands thereby, a brake for the wheel, and a device for releasing the pinion and actuating the brake.

8. A hand setting device for clock mecha-
 75 nism including an escapement wheel shaft, a pinion thereon, means for clutching and unclutching the pinion to and from the shaft, a wheel meshing with the pinion and forming a part of the time mechanism of
 80 the clock, pins on the wheel, a spring forming a brake element, and means for moving the spring into engagement with the pins of the wheel when the pinion is unclutched from the shaft.
 85

9. A hand setting device for clock mecha-
 nism including an escapement wheel shaft, a pinion thereon, means for clutching and unclutching the pinion to and from the shaft, a wheel meshing with the pinion and
 90 forming a part of the time mechanism of the clock, pins on the wheel, a spring forming a brake element, means for moving the spring into engagement with the pins of the wheel when the pinion is unclutched from
 95 the shaft, and a spring device for returning the said means to normal position when released.

10. In a clock setting device, the combination of an escapement wheel shaft, a pin-
 100 ion thereon, means for connecting or disconnecting the pinion to the shaft, a wheel meshing with the pinion, a brake element operating on the wheel to retard the movement thereof when the pinion is disconnect-
 105 ed from the shaft, and means for operating the brake element for controlling the wheel to move step by step.

11. In a setting mechanism for a clock hands, a wheel operatively connected with
 110 the hands, an escapement controlling the movement of the wheel, means for rendering the escapement inoperative, and a brake device for retarding the movement of the wheel as the same turns for setting the clock
 115 hands.

12. In a setting mechanism for a clock, hands, a wheel operatively connected with
 the hands, an escapement controlling the movement of the wheel, means for rendering
 120 the escapement inoperative, pins on the said wheel, and a spring movable into engagement with the pins for retarding the movement of the wheel when the escapement is inoperative and the hands of the clock are
 125 setting.

13. In a clock setting mechanism, the combination of hands, a wheel operatively con-
 nected with the hands, an escapement, means
 for rendering the escapement inoperative to
 130

permit the wheel to turn independently thereof, a device acting as a brake when the escapement is inoperative to retard the rotation of the wheel, and means including a
 5 push button for actuating the device to engage and disengage the wheel successively to permit the latter to move step by step for fine adjustment of the clock hands.

14. In a clock setting mechanism, the combination of hands, a wheel operatively connected with the hands, an escapement, a device for rendering the escapement inoperative, a spring on the device, pins on the wheel with which the spring is adapted to
 15 engage when the escapement is inoperative, and means for actuating the device to move the spring into and out of engagement with the pins successively to permit a step by step movement of the said wheel.

20 15. In a clock setting mechanism, the combination of hands, a wheel operatively connected with the hands, an escapement controlling the movement of the wheel, a push bar operatively connected with the escapement for rendering the same inoperative,
 25 spaced devices on the wheel, and a spring on the bar movable into the path of the devices when the bar is actuated to release the escapement, said bar being shiftable laterally
 30 to change the position of the spring to the said devices for permitting the bar to be reciprocated to successively throw the escapement into and out of operation and engage the spring with the successive devices to permit the wheel to move step by step in accurately setting the clock hands.

16. In a clock mechanism, the combination

of hands, a wheel operatively connected with the hands, an escapement, a forward setting device for releasing the escapement to permit the wheel to turn and move the hands
 40 of the clock forwardly by the clock mechanism, and a device movable into engagement with the wheel for turning the latter without the escapement interfering to set the
 45 hands of the clock independently of the clock mechanism.

17. In a clock setting apparatus, the combination of a clock mechanism including hands, a wheel operatively connected with
 50 the hands, an escapement, means for throwing the escapement out of operation to permit the wheel to turn automatically in forward setting of the hands, and means movable into engagement with the said wheel
 55 for turning the wheel manually in the forward or backward setting of the clock hands.

18. In clock setting apparatus, the combination of an escapement shaft, a pinion loosely mounted thereon, a normally-closed
 60 clutch for operatively connecting the pinion with the shaft, a wheel forming a part of the clock mechanism and meshing permanently with the pinion, and a setting device normally disengaged from the wheel and
 65 movable to engage and turn the same while the pinion slips on the shaft.

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

FRANK LIVINGSTON.

Witnesses:

CHAS. HALE,
 A. C. MYERS.