

No. 772,223.

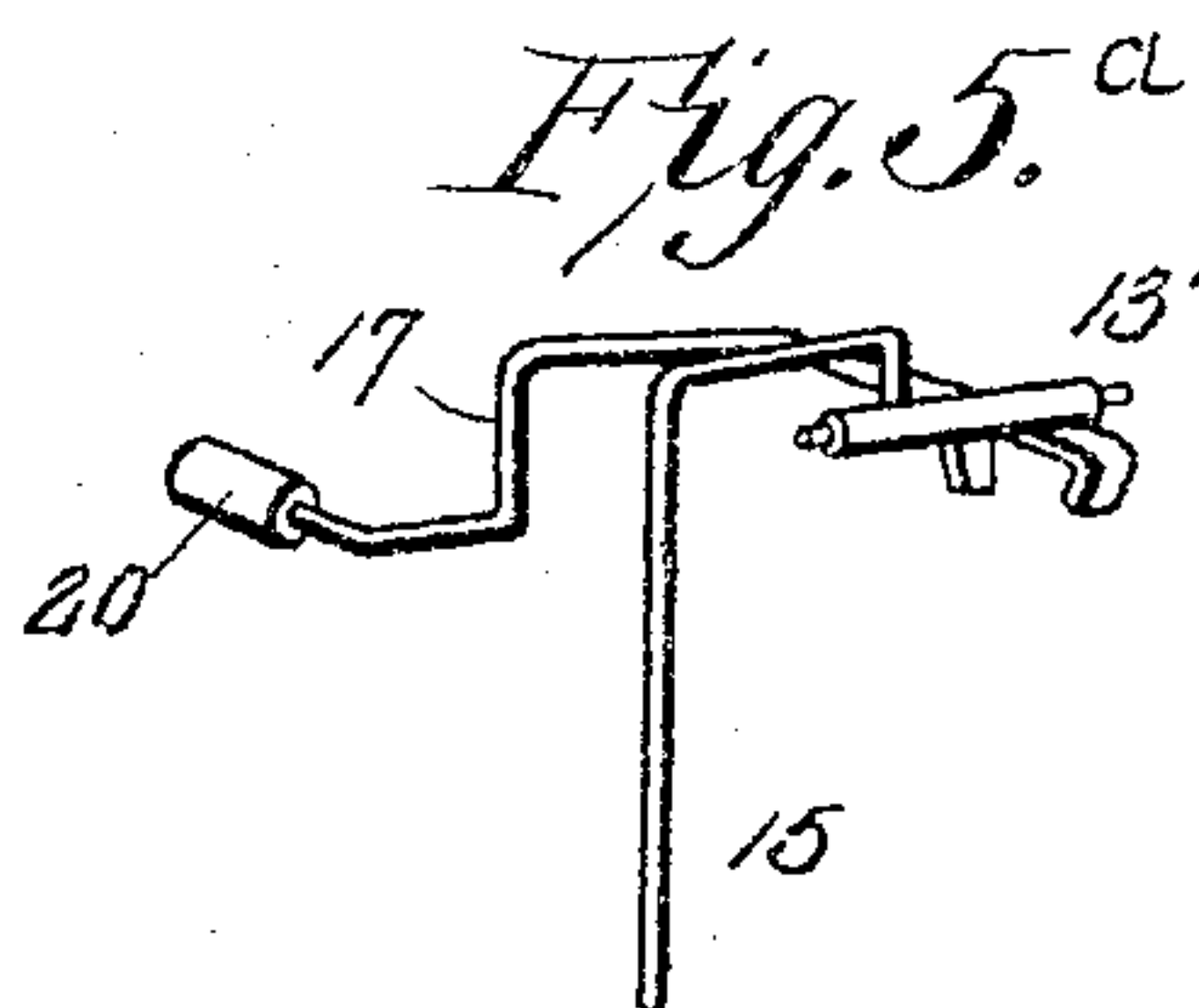
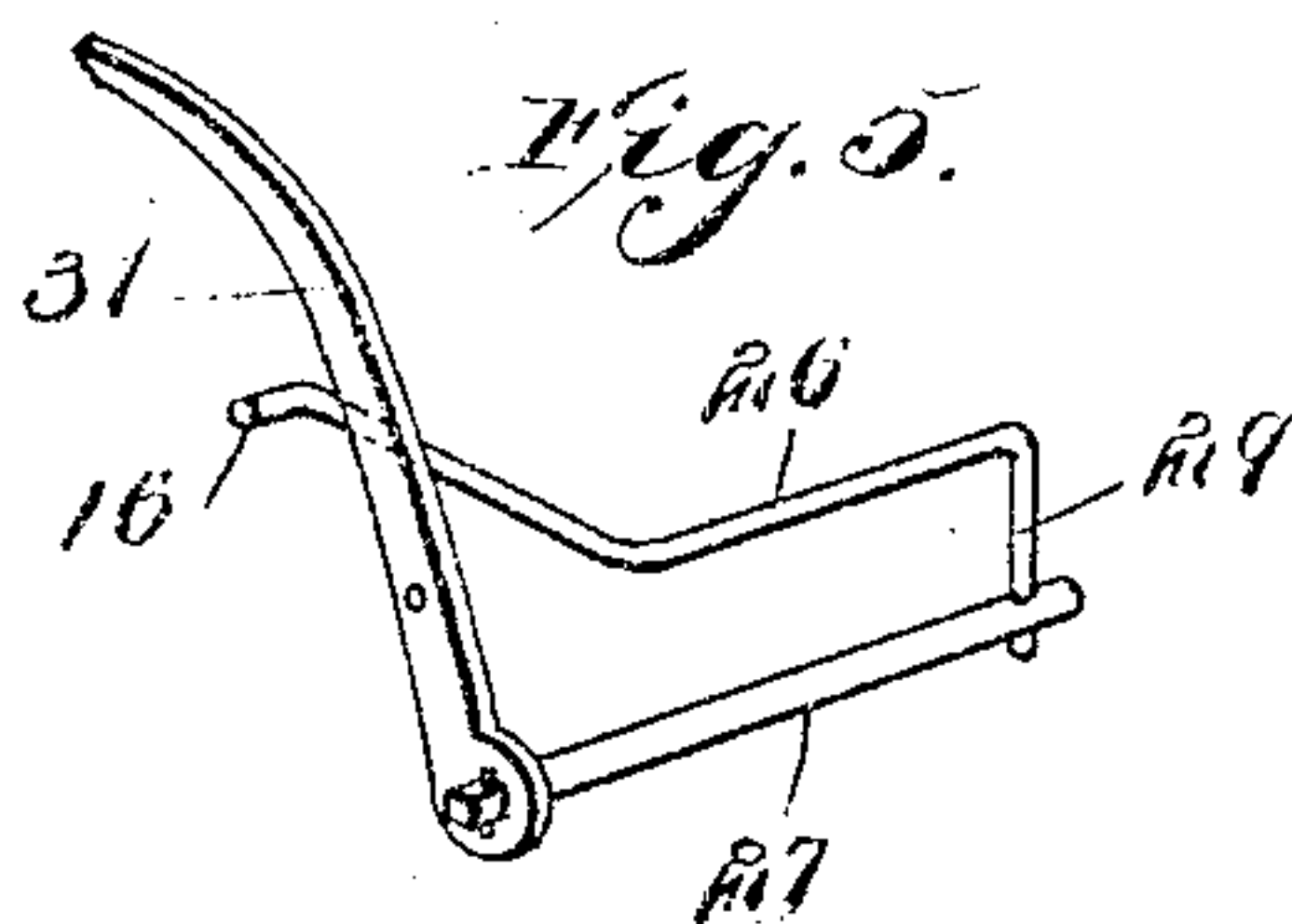
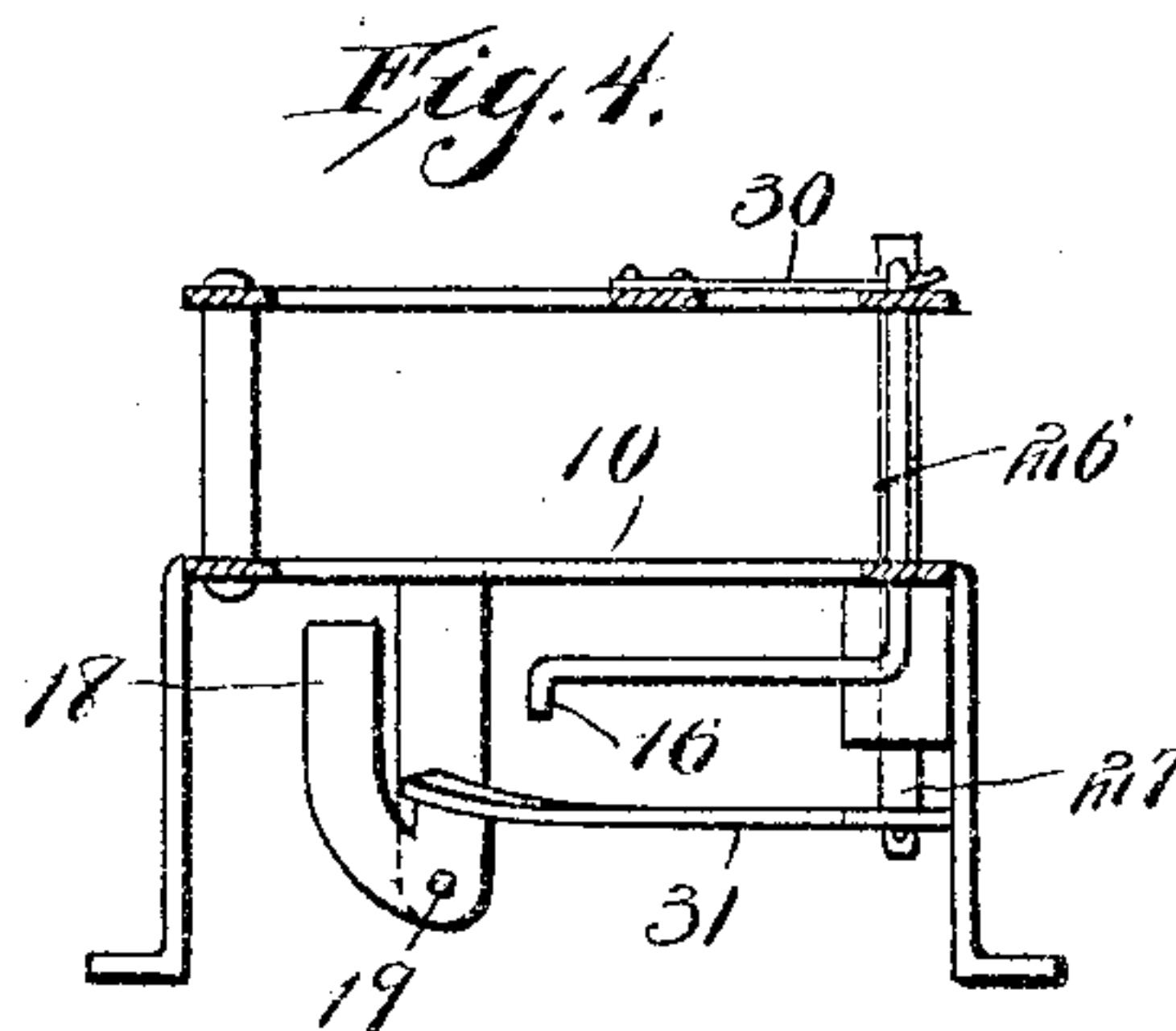
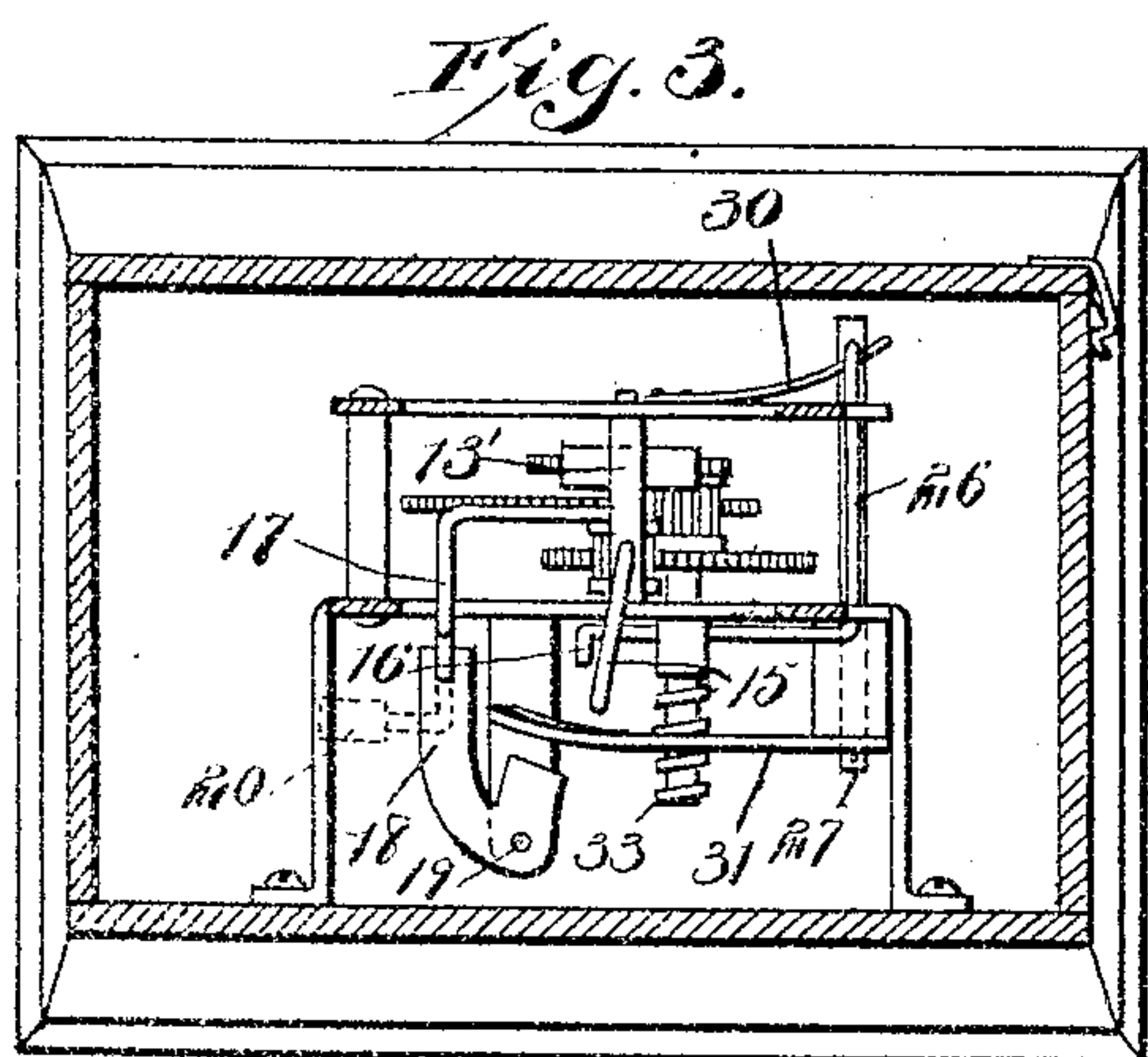
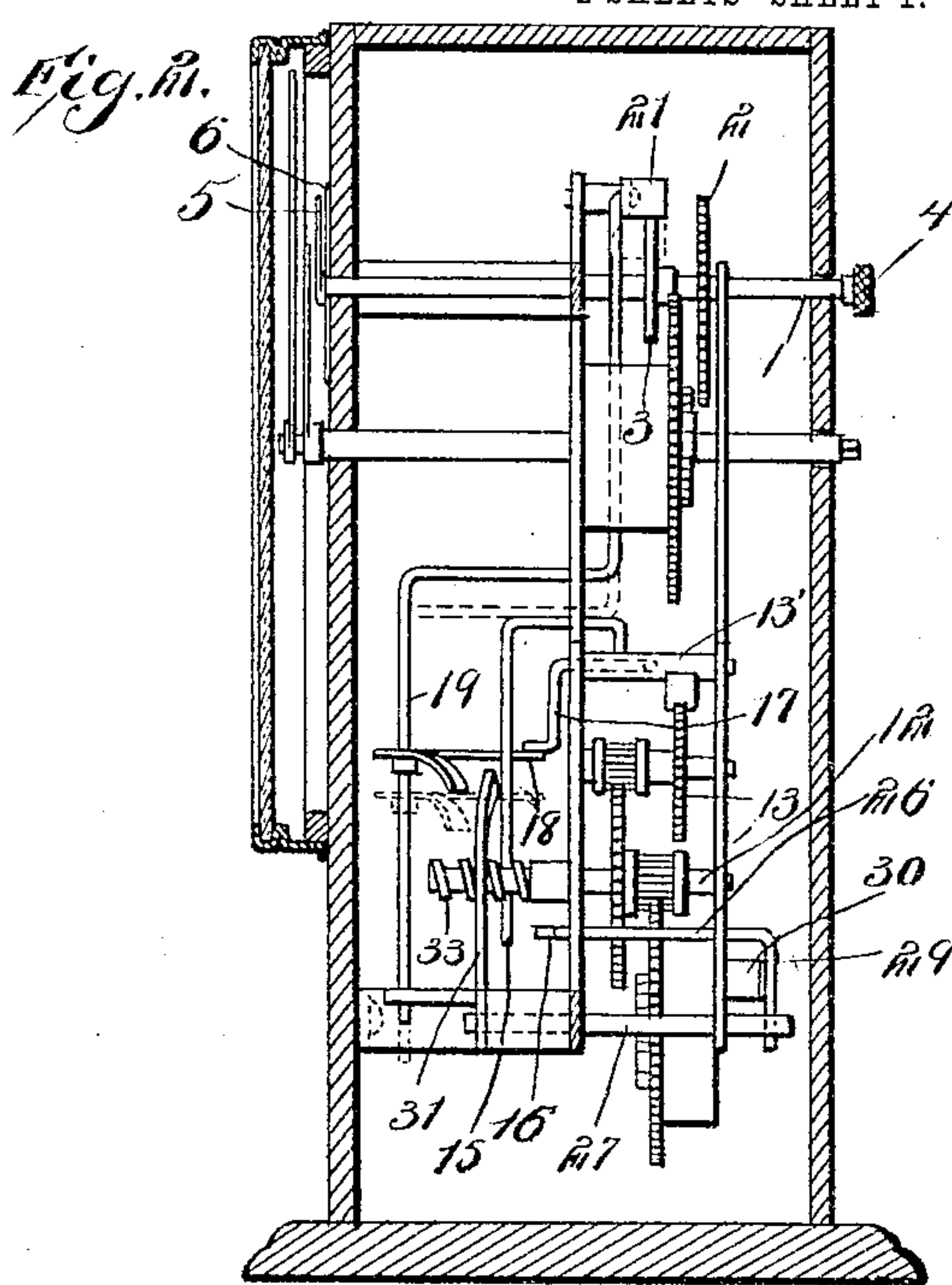
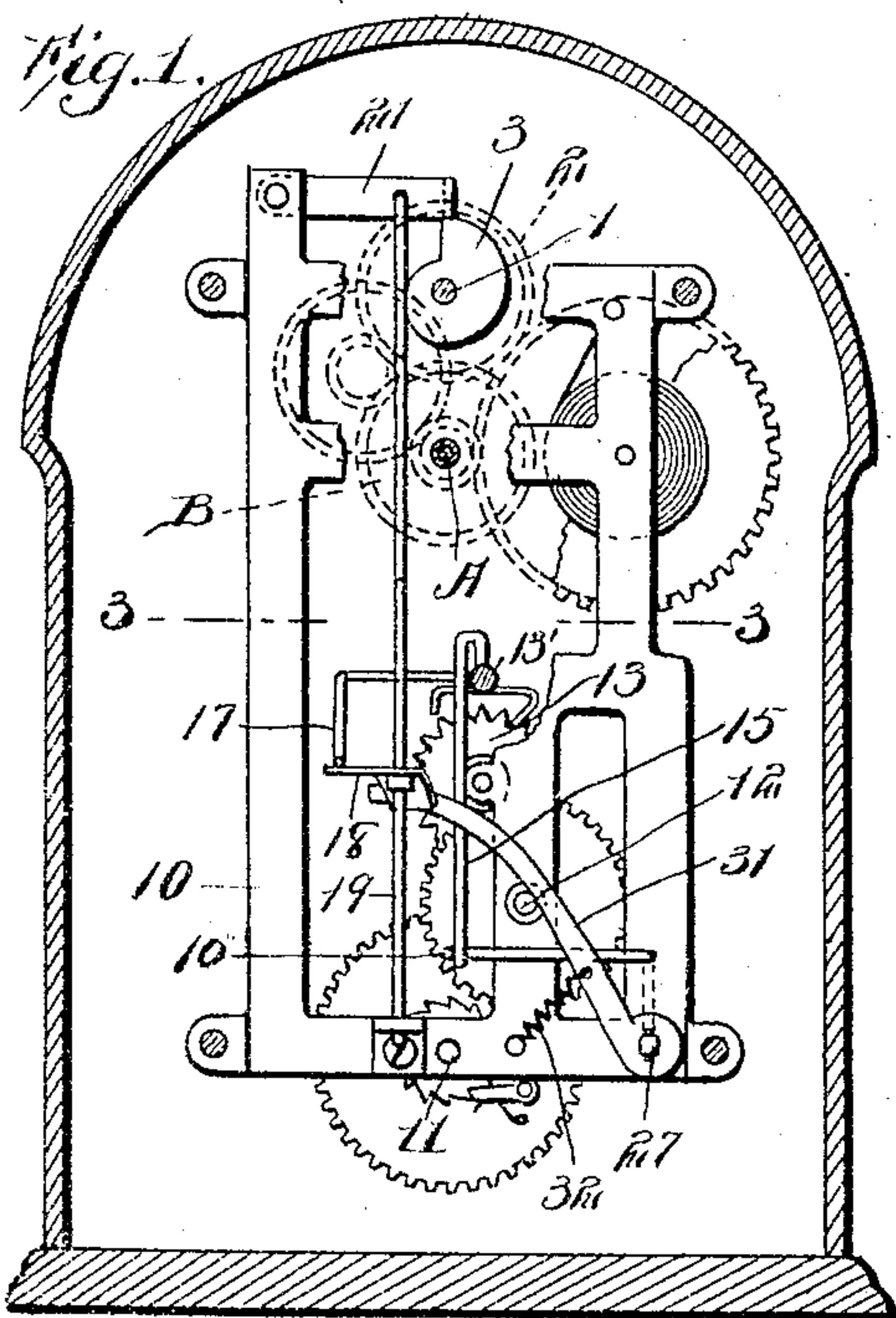
PATENTED OCT. 11, 1904.

T. J. DANIEL.
ALARM CLOCK.

APPLICATION FILED AUG. 8, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses

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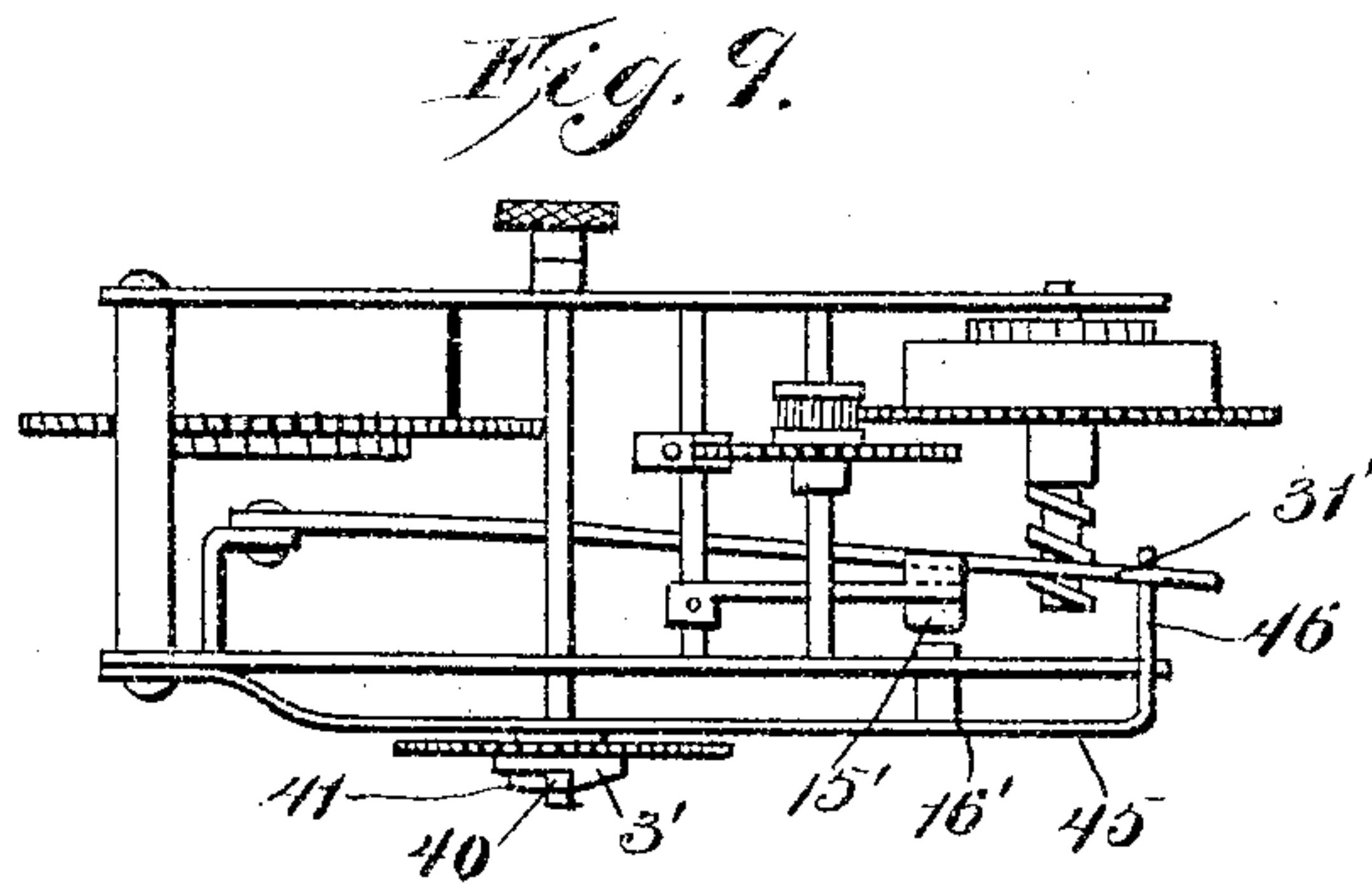
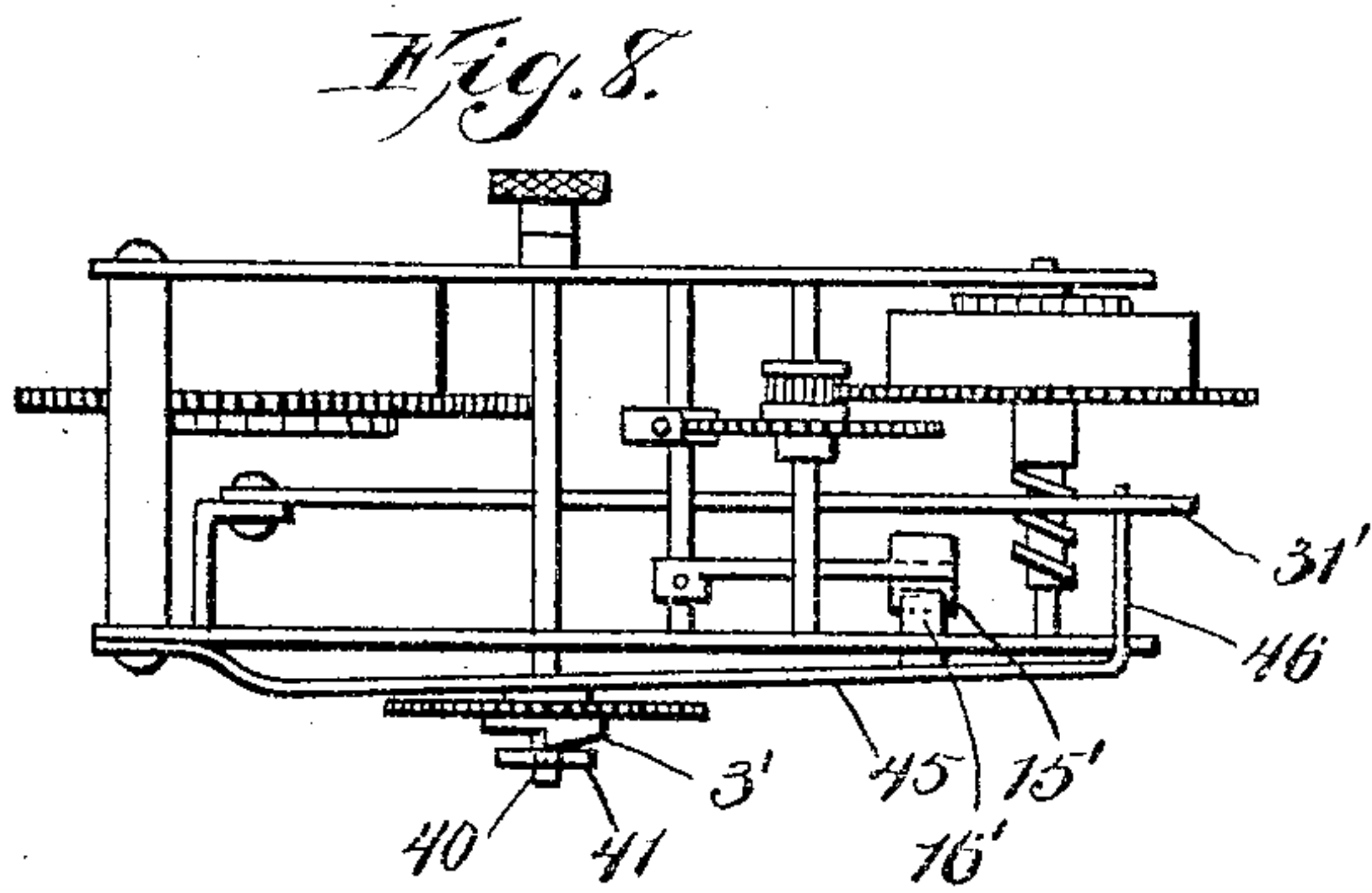
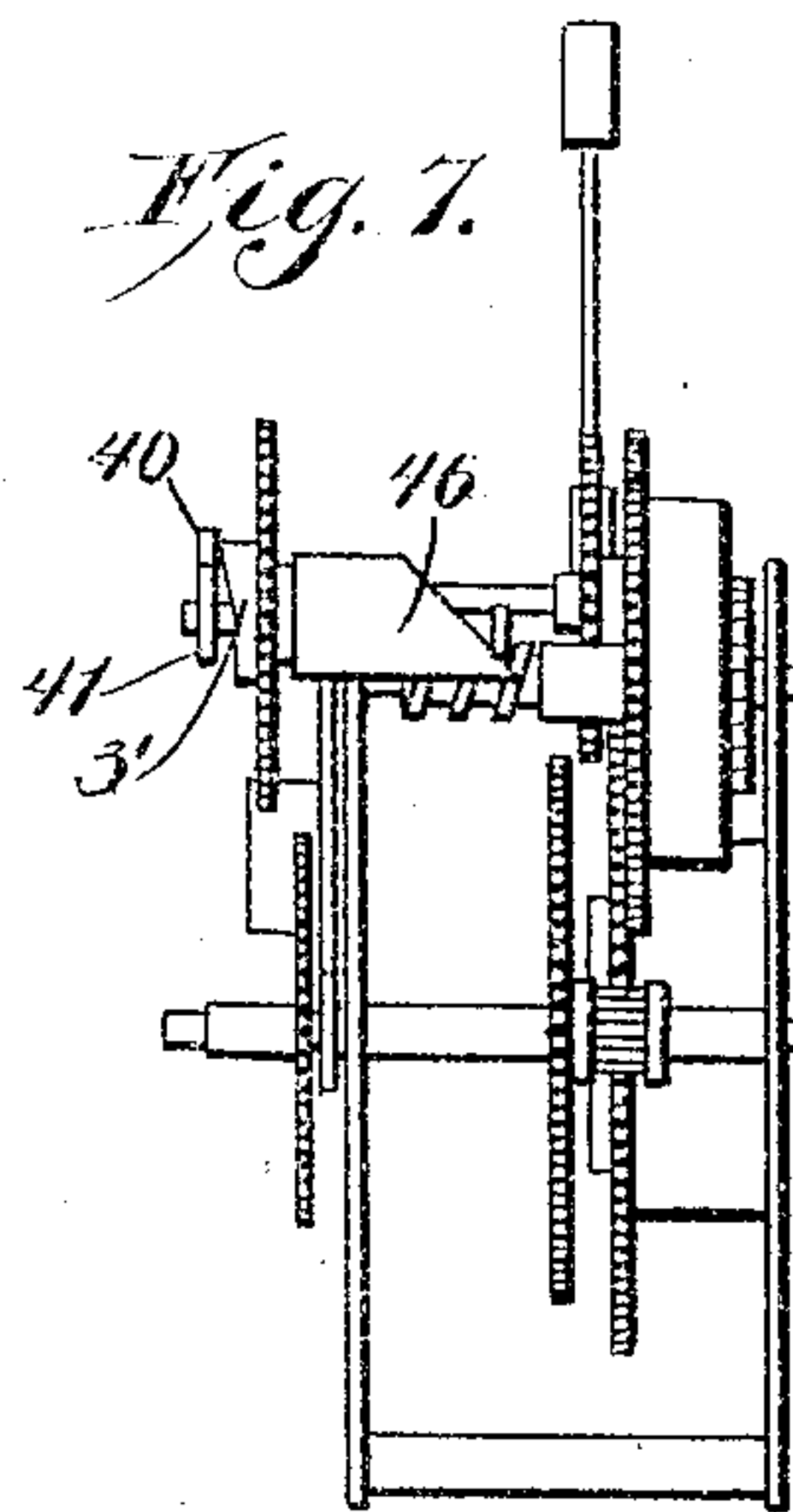
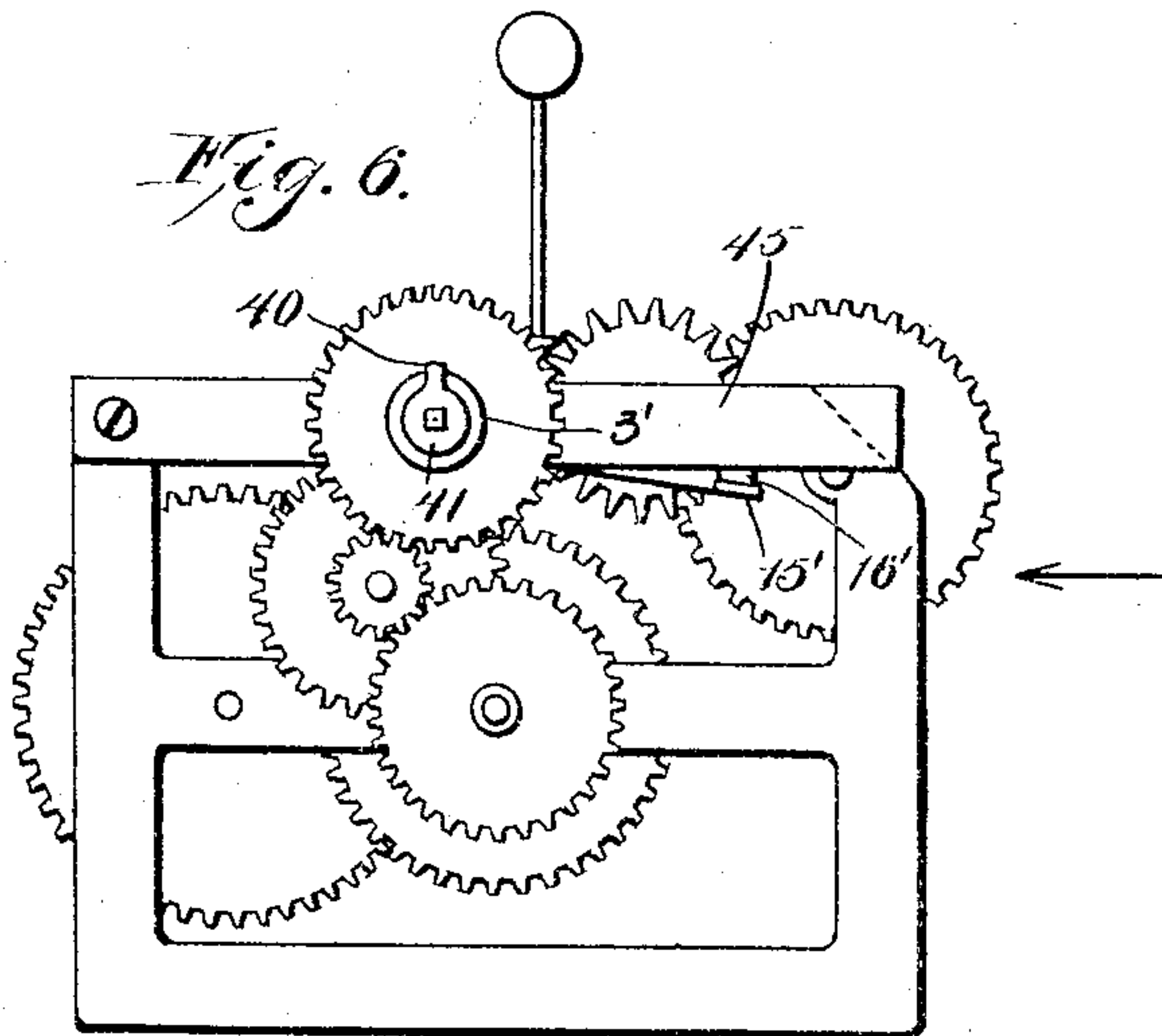
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2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

TURNER J. DANIEL, OF BUTLER, ALABAMA.

ALARM-CLOCK.

SPECIFICATION forming part of Letters Patent No. 772,223, dated October 11, 1904.

Application filed August 8, 1903. Serial No. 168,812. (No model.)

To all whom it may concern:

Be it known that I, TURNER J. DANIEL, a citizen of the United States, residing at Butler, in the county of Choctaw and State of Alabama, have invented a new and useful Alarm-Clock, of which the following is a specification.

The invention relates to improvements in alarm-clocks, and has for its principal object to provide a novel form of alarm mechanism which may be applied to eight-day clocks or other alarm timing mechanisms that require winding only at comparatively long intervals of time, the alarm mechanism being so constructed and arranged as to operate at exactly the same time each day without requiring any setting or rewinding of the alarm-actuating spring for each operative movement.

A further object of the invention is to provide a device of this character which may be applied to existing clock mechanisms.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is an elevation of an alarm mechanism constructed in accordance with the invention, the casing being shown in section. Fig. 2 is a transverse sectional elevation of the same. Fig. 3 is a sectional plan view of the device on the line 3-3 of Fig. 1. Fig. 4 is a detail perspective view of a portion of the mechanism. Fig. 5 is a detail perspective view of one of the stops of the alarm mechanism. Fig. 5^a is a similar view of the clapper-rod, the escapement arbor, and connected parts. Fig. 6 is a front elevation illustrating a slight modification of the invention. Fig. 7 is an end elevation of the same looking in the direction of the arrow of Fig. 6. Fig. 8 is a plan view of the modified construction with the parts in normal position. Fig. 9 is a similar view

showing the position assumed by the parts at the completion of sounding of the alarm.

Similar characters of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The clock-train includes a main arbor A and the usual gears B.

In the frame is journaled an arbor 1, on which is frictionally mounted a gear 2, that receives motion from the clock-train, the arbor 1 receiving one complete rotation during each twenty-four hours. On the arbor 1 is a timing-cam 3, and said arbor is provided with a milled knob 4, arranged outside of the clock-casing and provided with a pointer 5, that is movable over an indicating-dial 6 in order that the cam may be set in accordance with the time at which it is desired to have the alarm sounded. This mechanism is of the same character as that ordinarily employed in alarm-clocks.

The alarm mechanism is supported in a frame 10. The spring-carrying shaft 11 is connected by gearing to an arbor 12, and the latter in turn is geared to an arbor carrying an escapement-wheel 13, with which engages an anchor 13', these portions of the mechanism being of the character in ordinary use in various forms of alarm mechanisms. To the anchor-arbor is secured an arm 15, with which engages a stop 16, normally holding the anchor from operative movement, and in addition to this a second arm 17, forming the bell-clapper rod, is engaged by an arm 18, carried by the vertically-guided rod 19, so that in order to allow the sounding of the alarm it is necessary to move both the stop 16 and the arm 18 from engagement with the anchor-carried members. The clapper-rod 17 carries the usual clapper 20 for engagement with any form of gong. The vertically-disposed rod 19 is connected at its upper end to a lever 21, pivoted to the clock-frame and having its free end resting on the timing-cam 3, so that when the cam has been turned to proper position and its substantially radial shoulder passes the lever the latter will fall, together with the rod 19, and will move arm 18 from under the clapper-rod. The frame 10 serves as a sup-

port for a rock-shaft 27, to one end of which is secured an arm 29, that is bent, as indicated at 26 in Fig. 5, into parallel relation with the rock-shaft, and thence is bent at right angles and terminates in the stop 16. On the bar 29 bears a leaf-spring 30, tending to move the bar and the rock-shaft toward the rear of the frame, and on the front end of the shaft 27 is a slightly-curved arm 31, that normally projects into the path of movement of the cam-shaped inner end of the arm 18, and said arm 31 is held in engagement with a screw or helical cam 33, carried by the arbor 12, by means of a coiled tension-spring 32.

During intervals between the operation of the alarm mechanism the timing-cam 3 holds the lever 21 elevated and the arm 18 in engagement with the clapper-rod 17. At this time arm 31 is engaged with the inner end of the screw or helical cam 33. When the shoulder of the timing-cam has moved past the lever 21 and the latter descends, the arm 18 is moved away from the clapper-rod, and the anchor is then free from movement under the influence of its actuating-spring, so that the clapper-rod will vibrate and sound the alarm. During the sounding of the alarm the arbor 12 and its helical cam or screw 33 are rotated, and as the latter is in engagement with arm 31 said arm will be moved forward and outward and will carry the rock-shaft 27 and bar 29 in the same direction until the stop 16 engages the anchor-carried arm 15 and stops the movement of the anchor. The outward movement of the arm 31 gradually forces it into engagement with the arm 18, and the end of this arm, as indicated more clearly in Fig. 2, is bent downward, forming a cam-face, with which the arm 31 engages and by which it is raised from the helical cam or screw 33. As soon as this occurs the spring 30 will immediately move the rock-shaft and bar 29 to the rear, and arm 31 will again be brought into contact with the inner end of the helical cam. This movement does not occur immediately after the sounding of the alarm has ceased, but is brought about by the continued rotative movement of the timing-cam, which as it gradually raises the lever 21 and rod 19 brings the arm 18 into engagement with the clapper-rod, and the arm 18 elevates arm 31 in order to permit the latter to return to its initial position. It will thus be seen that the two stops operate alternately, one normally holding the clapper-rod from movement between intervals of operation of the alarm and the other catching and temporarily holding the escapement mechanism until the first stop is restored to its initial position.

In the modified construction illustrated in Figs. 6, 7, 8, and 9, the cam 3' is in the form of a crown-cam; but its operation is the same as that previously described. This cam engages a pin 40, projecting from a collar 41 of

the adjustable arbor of the alarm mechanism. This arbor is held from longitudinal movement, and the gear which forms a part of the cam or is rigidly secured thereto is held outward, and the cam is held in engagement with the pin 40 by means of a spring 45, secured at one end to the clock-train. At the opposite end of the spring 45 is a finger 16', adapted to engage a lug 15', carried by the anchor-arbor and normally holding the anchor from operative movement. When the shoulder of the cam passes beyond the pin 40, the spring 45 forces both the cam and the gear outward, and the stop 16' moves from engagement with the lug 15' in order to allow free movement of the anchor and the sounding of the alarm. The screw-shaft or helical cam and the arm with which said cam engages (indicated at 31') are substantially the same as that previously described, and the end of the spring is bent to form a tongue 46, having an inclined face with which said arm 31' engages at the completion of the vibratory movement of the bell-clapper, and said arm 31' then becomes locked between the inclined face of tongue 46 and that portion of the screw-thread or helical cam with which it remains in contact. When the rotative movement of the timing-cam arbor carries the timing-cam a sufficient distance, the spring 45 will be depressed and forced inward until the stop 16' engages lug 15' and on continued movement the tongue 46 will be forced inward until its inclined face raises the arm 31' above the helical cam and carries it to the rear in readiness for another operation.

The mechanism may be manufactured and applied to any ordinary clock, and the alarm-actuating spring is preferably of sufficient length to permit a number of operations—say eight times in an eight-day clock or thirty times in a thirty-day clock—so that it becomes unnecessary to effect rewinding of the spring after each operation of the alarm.

Having thus described the invention, what is claimed is—

1. The combination with a clock-train including a timing-cam, of an alarm-train including an actuating means and an escapement, a pair of successively-acting escapement-locking members, means controlled by the timing-cam for moving the first of said members to unlocked position, and a helical cam operated by the alarm-train for moving the second of said locking members to locked position.

2. The combination with a clock-train including a timing-cam, of an alarm-train including an actuating means and an escapement, a pair of successively-operative escapement-locking members, a helical cam operated by the alarm-train for moving the second of said members to locking position, and means controlled by the timing-cam for moving the first of said members to release posi-

tion, for restoring the first member to final locking position, and for restoring the second locking member to release position.

3. The combination with a timing mechanism, of a movable member, an alarm-train including an actuating means and an escapement, the escapement-anchor carrying said movable member, a helical cam actuated by the alarm-train, an arm engaging the helical cam actuated by the alarm-train, an arm engaging the helical cam, an escapement-locking mechanism movable with said arm, and means actuated by the timing-cam for restoring said arm to initial position after the completion of each operative movement.

4. In combination, a timing-cam, means for actuating the same, an alarm-train including an actuating means and an escapement, a pair of arms connected to and movable with the anchor of the escapement, means controlled by the timing-cam for engaging one of said arms and locking the same, a helical cam actuated by the alarm-train, an escapement-locking mechanism movable by said cam, and means actuated by the timing-cam for stopping the movement of said locking mechanism and restoring the same to initial position.

5. The combination with a timing-cam, of an alarm-train including an actuating means and an escapement, a pair of arms carried by the anchor-arbor, a helical cam actuated by the alarm-train, an arm engaging said helical cam, an escapement-locking member carried

by said arm and movable to engage one of the anchor-carried arms, a rod controlled by the timing-cam, an arm carried by said rod and engaging the second of the anchor-carried arms to lock the same against movement, and a cam carried by said locking-arm and serving to engage and restore the parts to initial position at the completion of each operative movement.

6. The combination with a timing-cam, of an alarm-train including an actuating means and an escapement, a pair of arms carried by the escapement-anchor, a rod controlled by the timing-cam and having an arm for engagement with one of the escapement-arms to thereby lock the same from movement, a rock-shaft, a rod connected thereto, said rod being movable to engage a second escapement-arm, an arm or finger carried by the rock-shaft, a helical cam driven by the clock-train and engaging said arm or finger, a spring for maintaining the arm or finger in engagement with the helical cam, and a cam carried by the timing-cam for engaging said arm or finger and restoring the same to initial position.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

TURNER J. DANIEL.

Witnesses:

J. WESLEY JOHNSTON,
F. L. BANFIELD.