

No. 610,154.

Patented Aug. 30, 1898.

F. A. BROWNELL.
PHOTOGRAPHIC SHUTTER.

(Application filed Aug. 23, 1897.)

(Model.)

4 Sheets—Sheet 1.

Fig. 1.

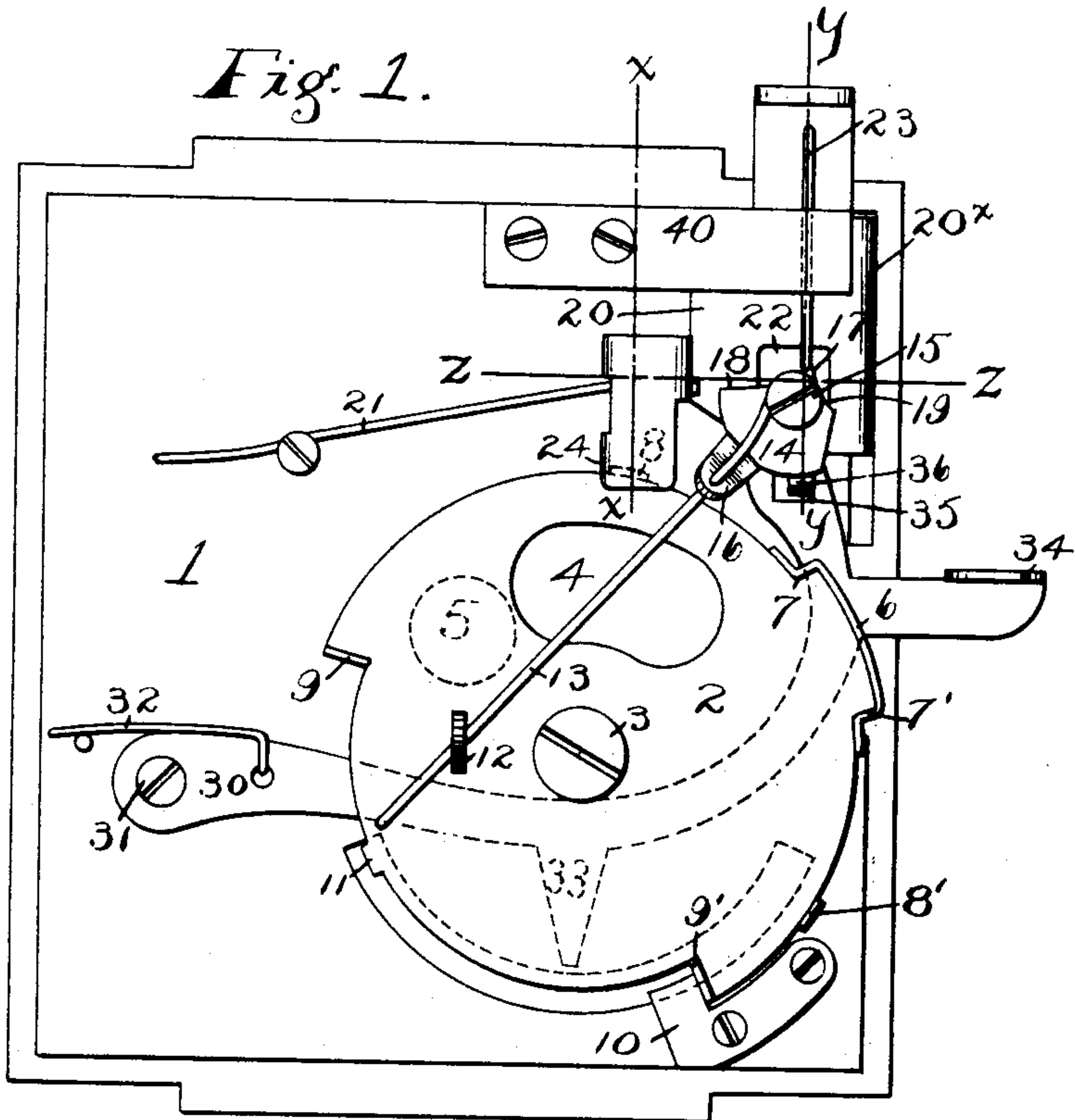
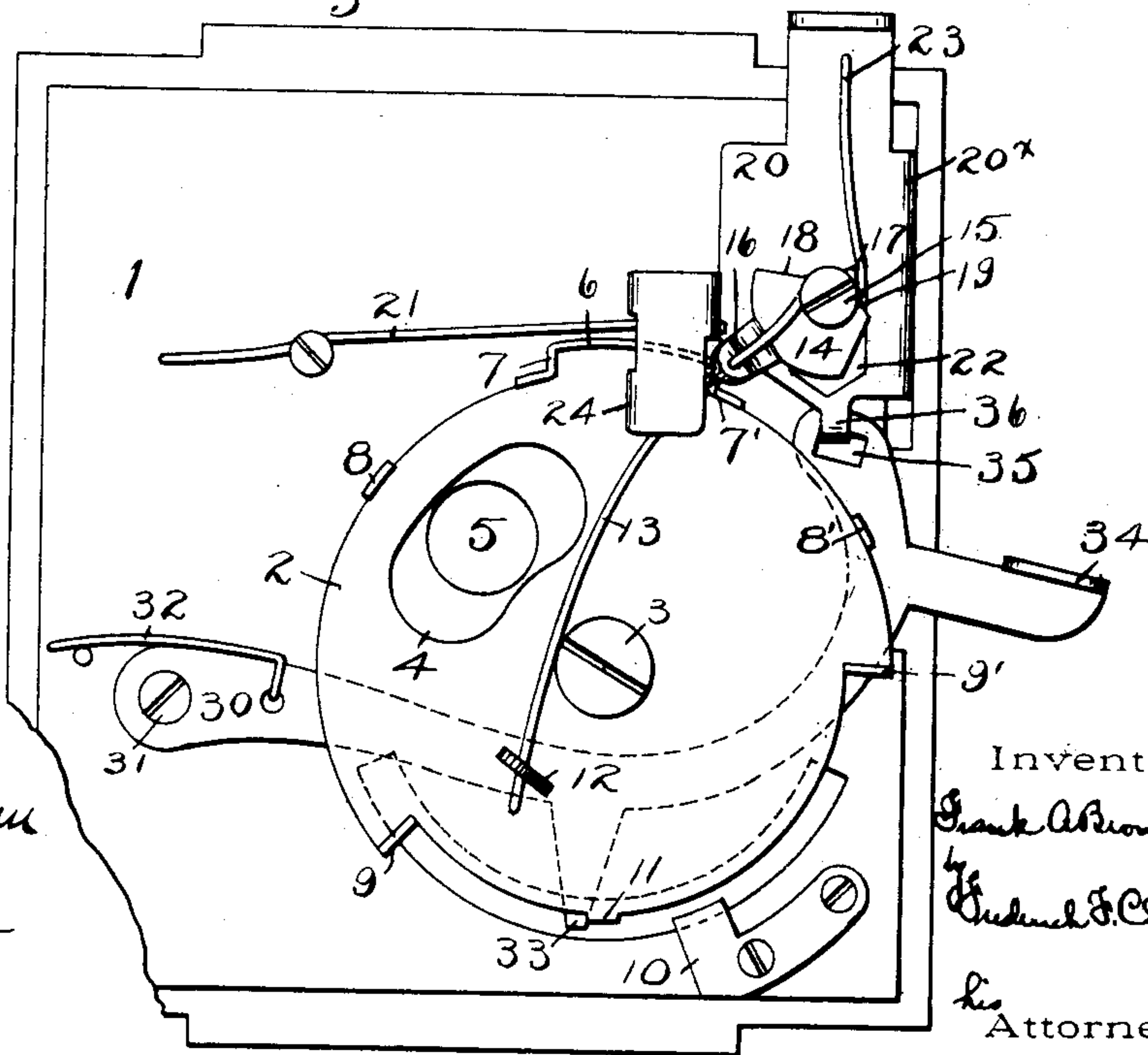


Fig. 2.



Witnesses.

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4 Sheets—Sheet 2.

Fig. 3.

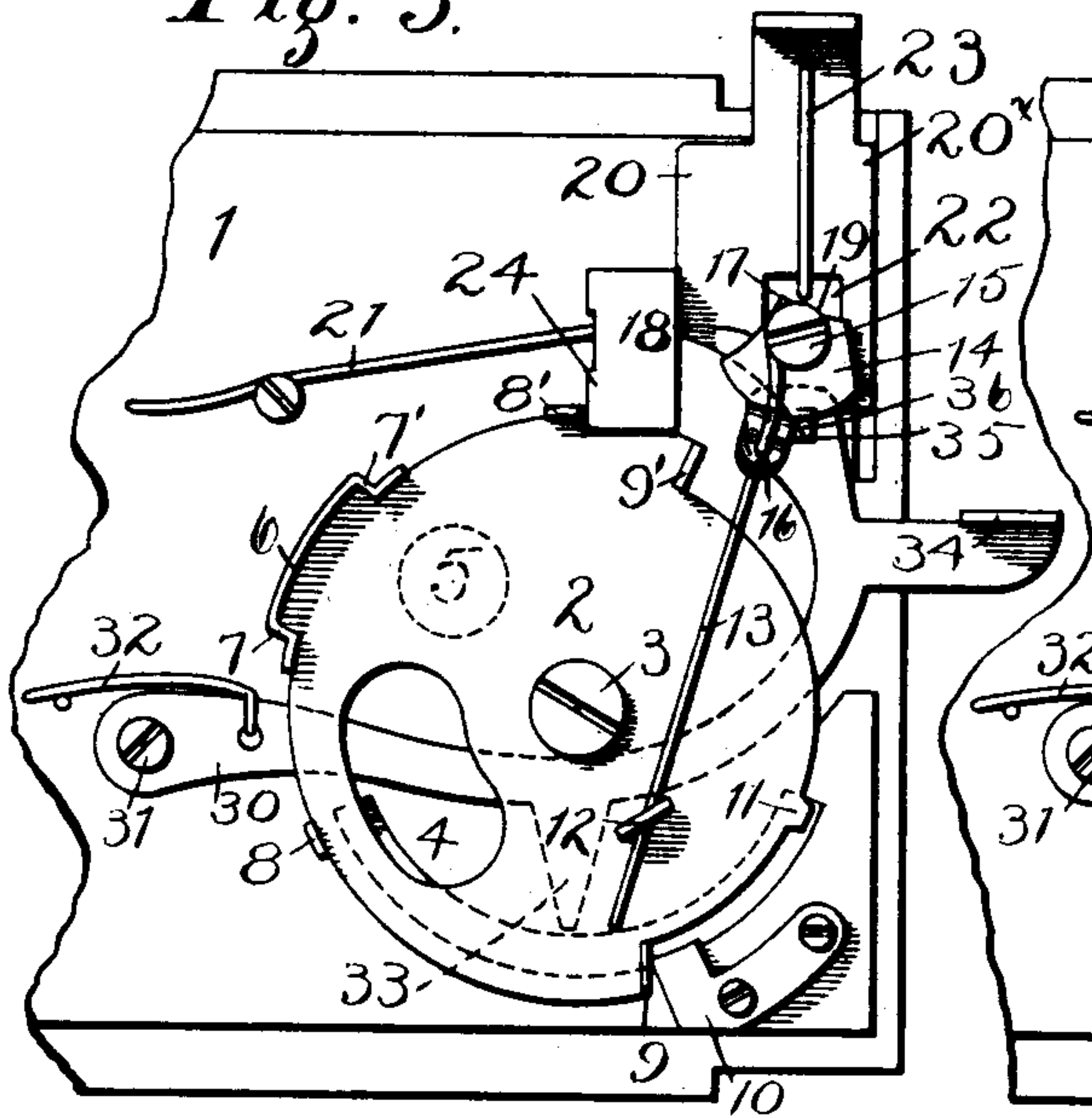


Fig. 4.

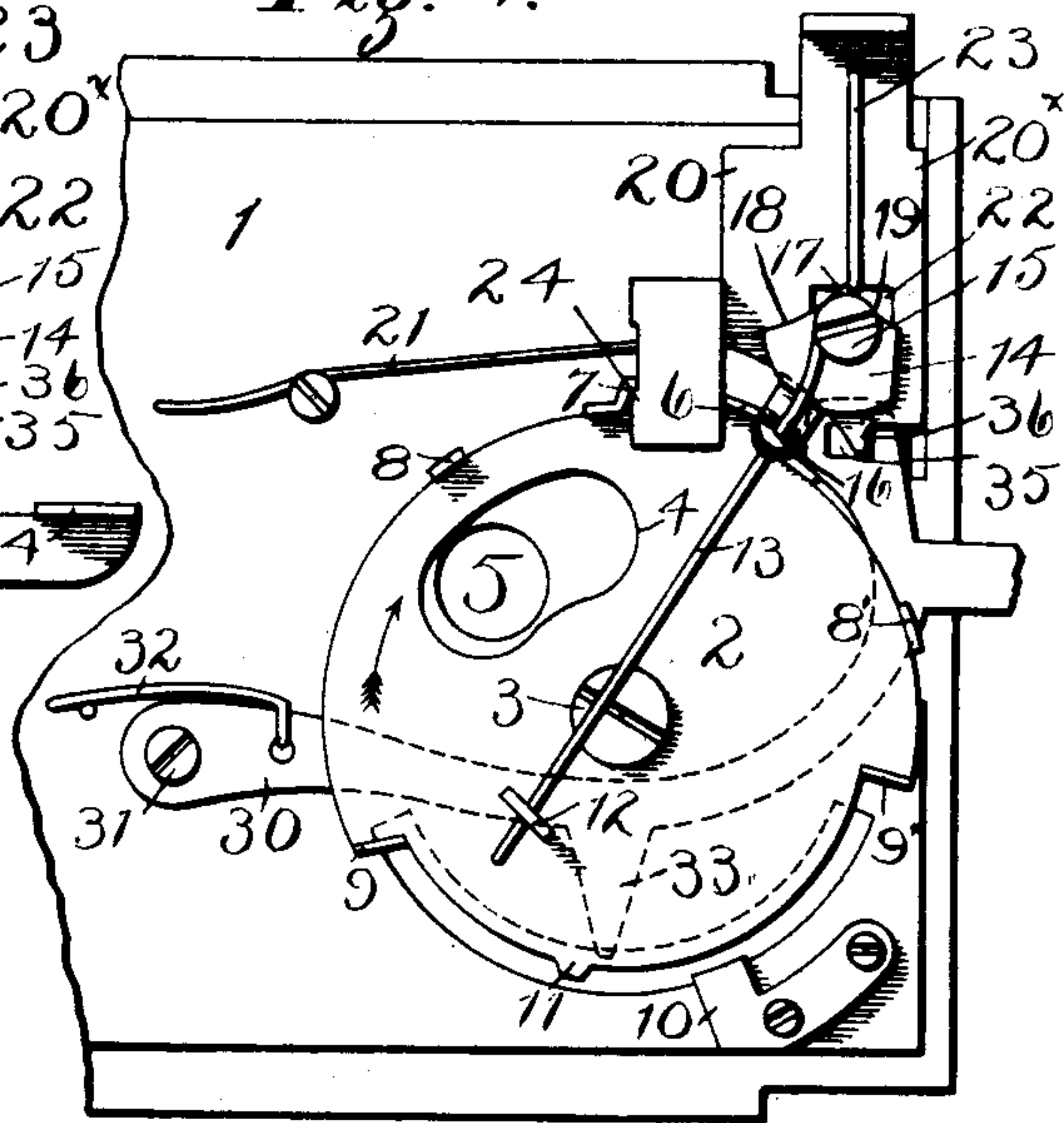


Fig. 5.

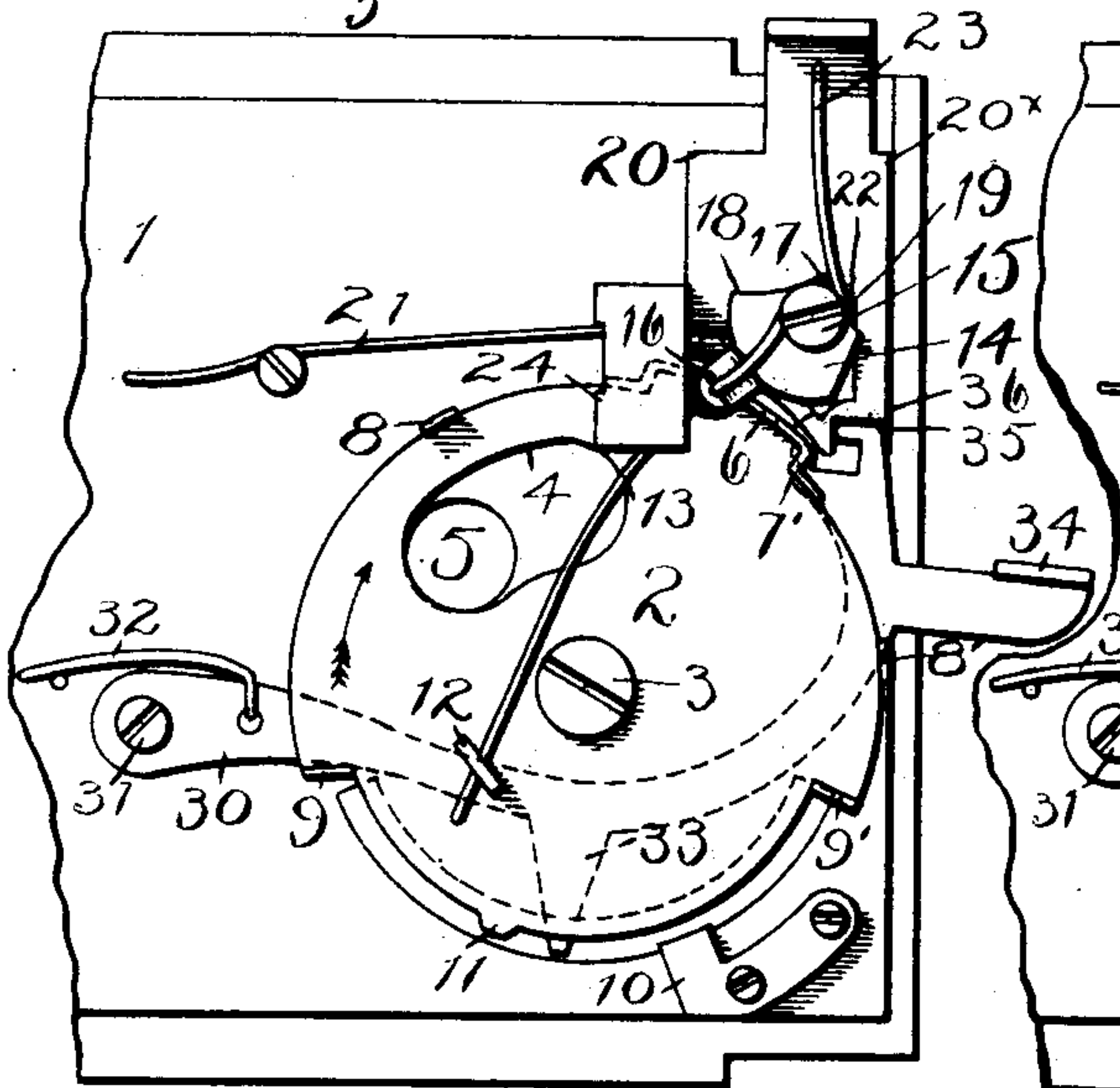
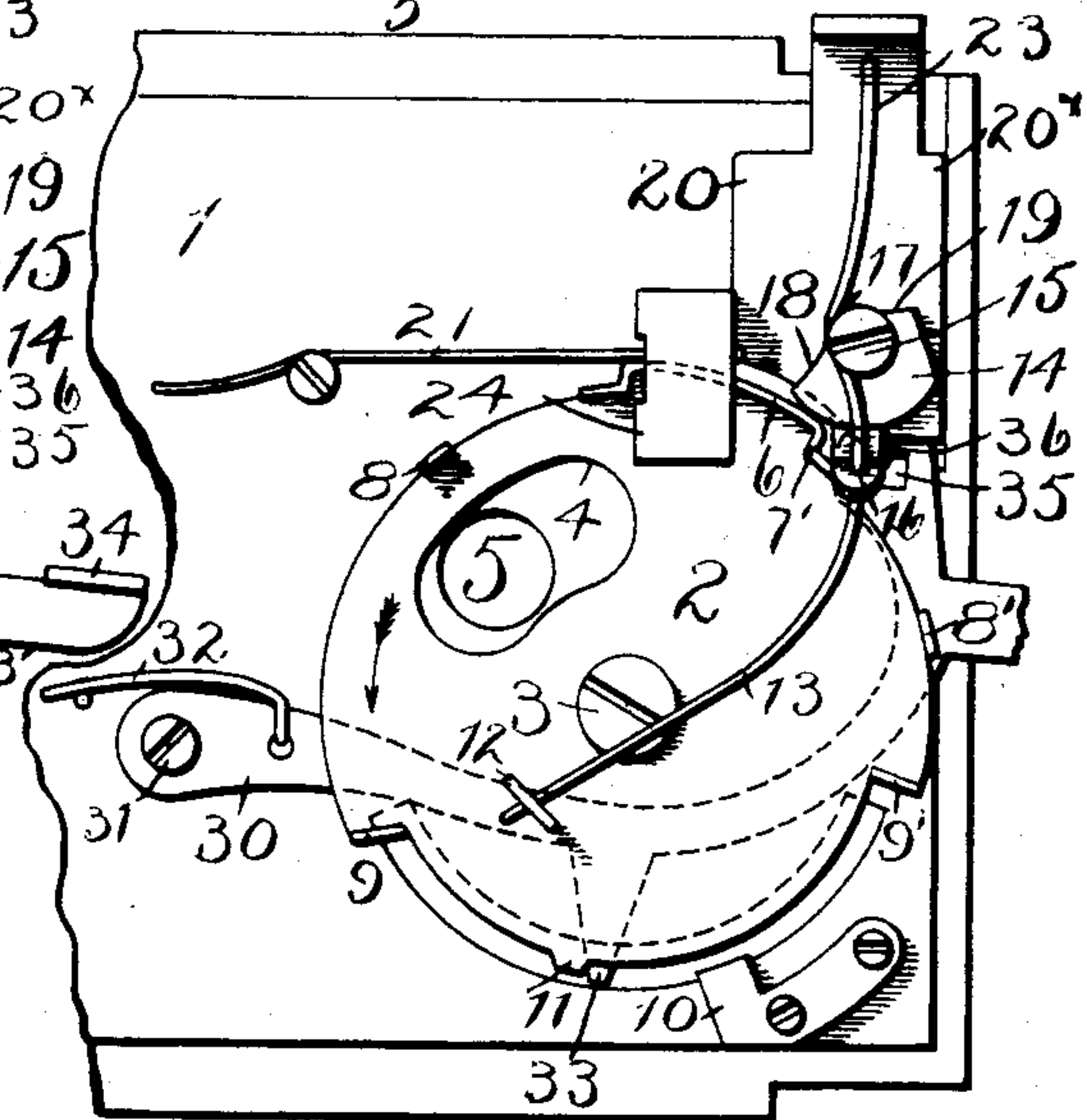


Fig. 6.



Witnesses.

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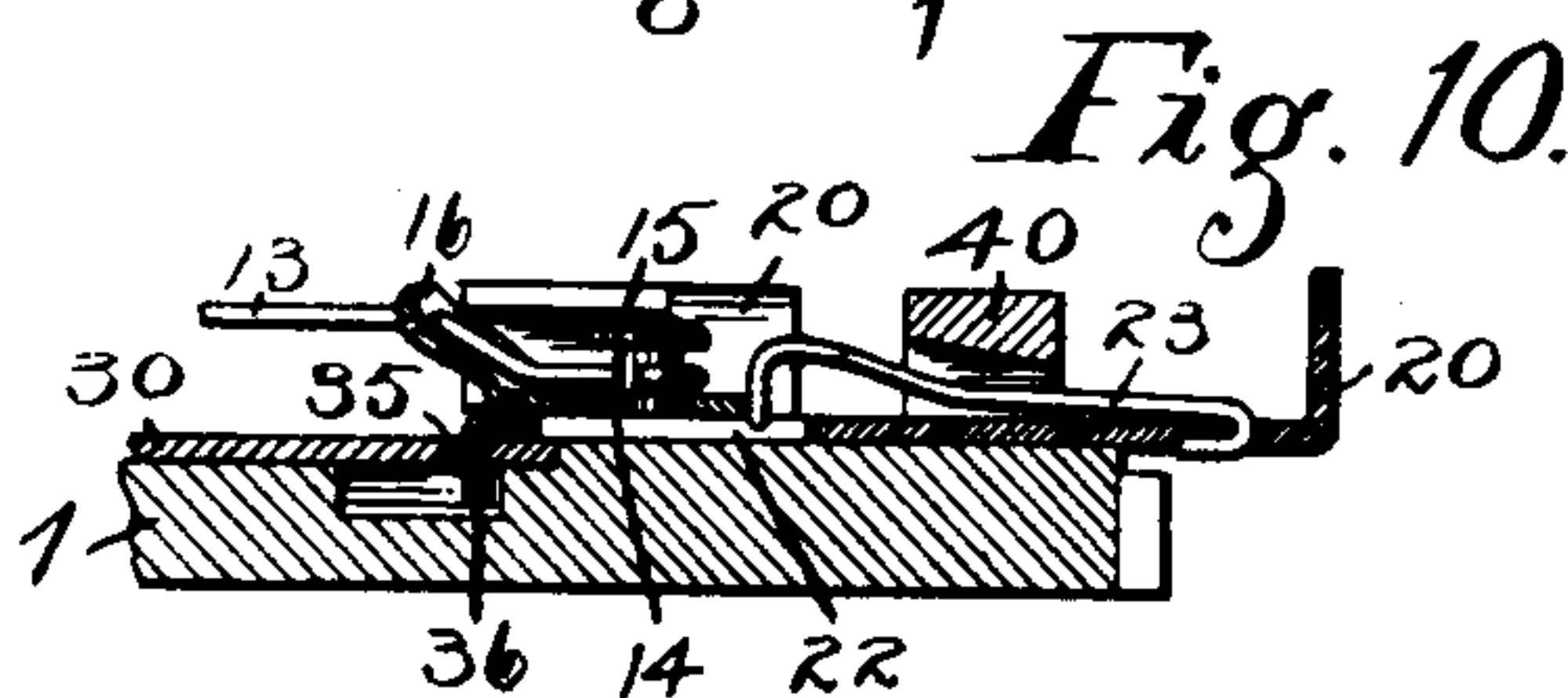
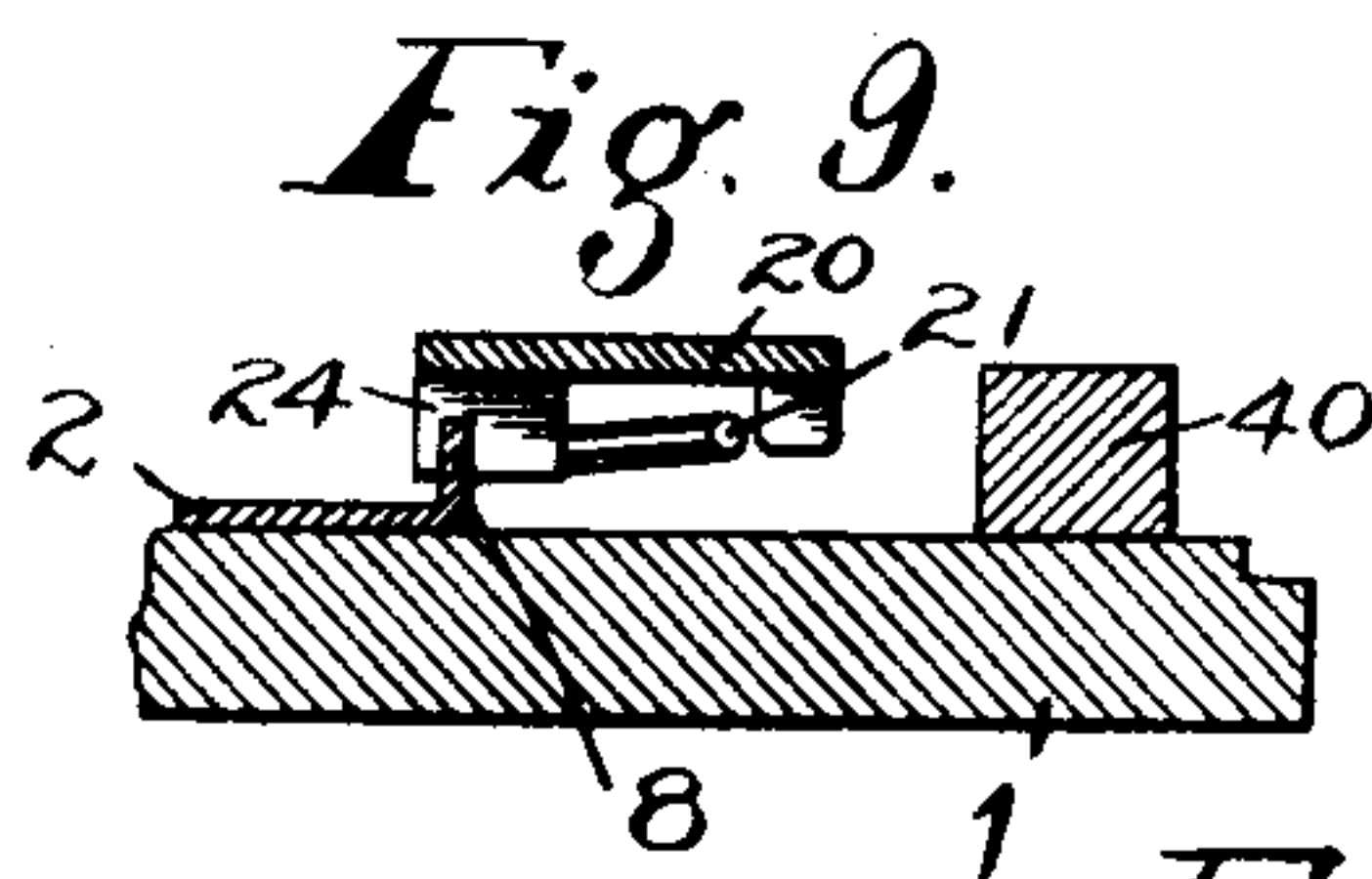
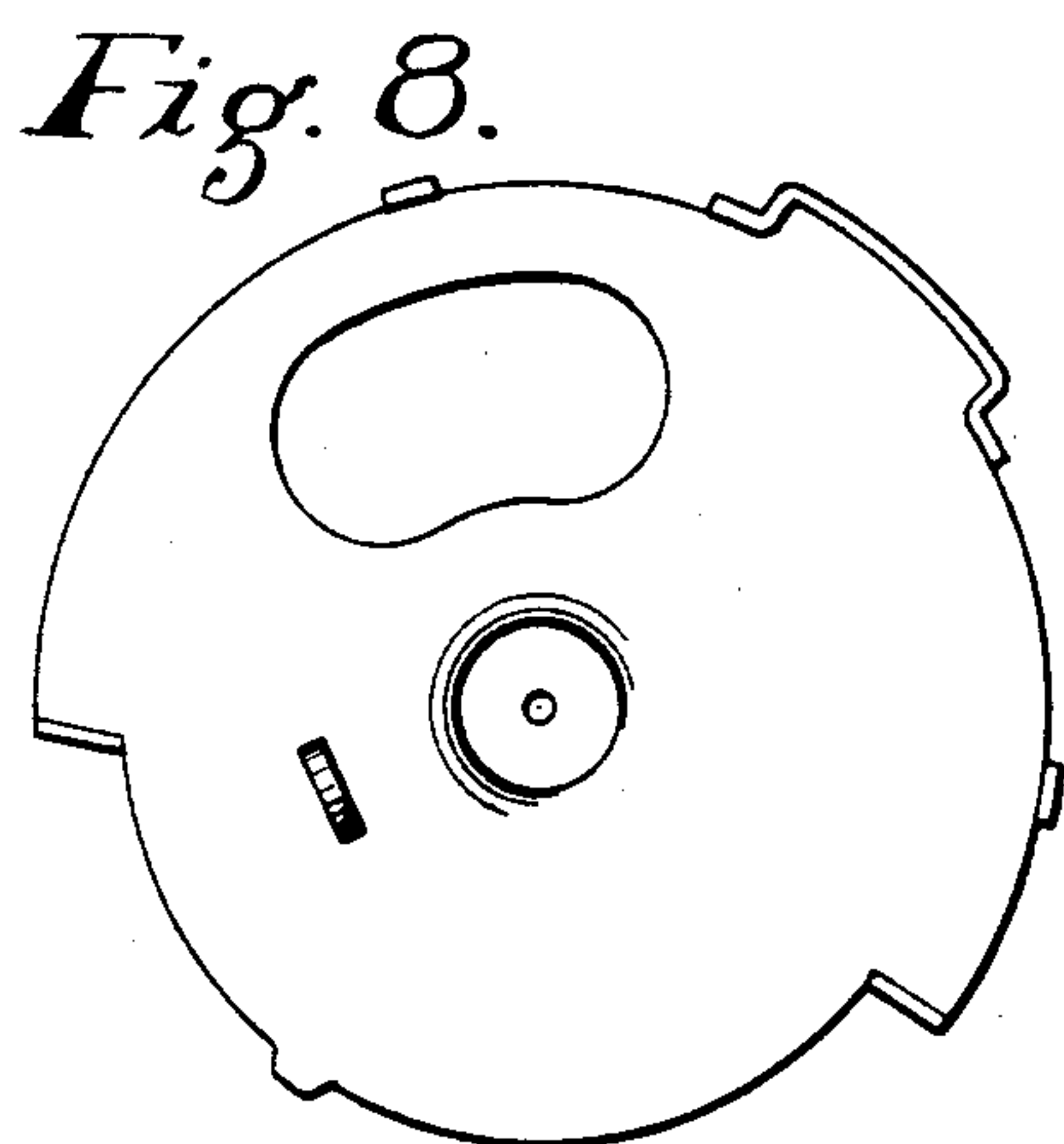
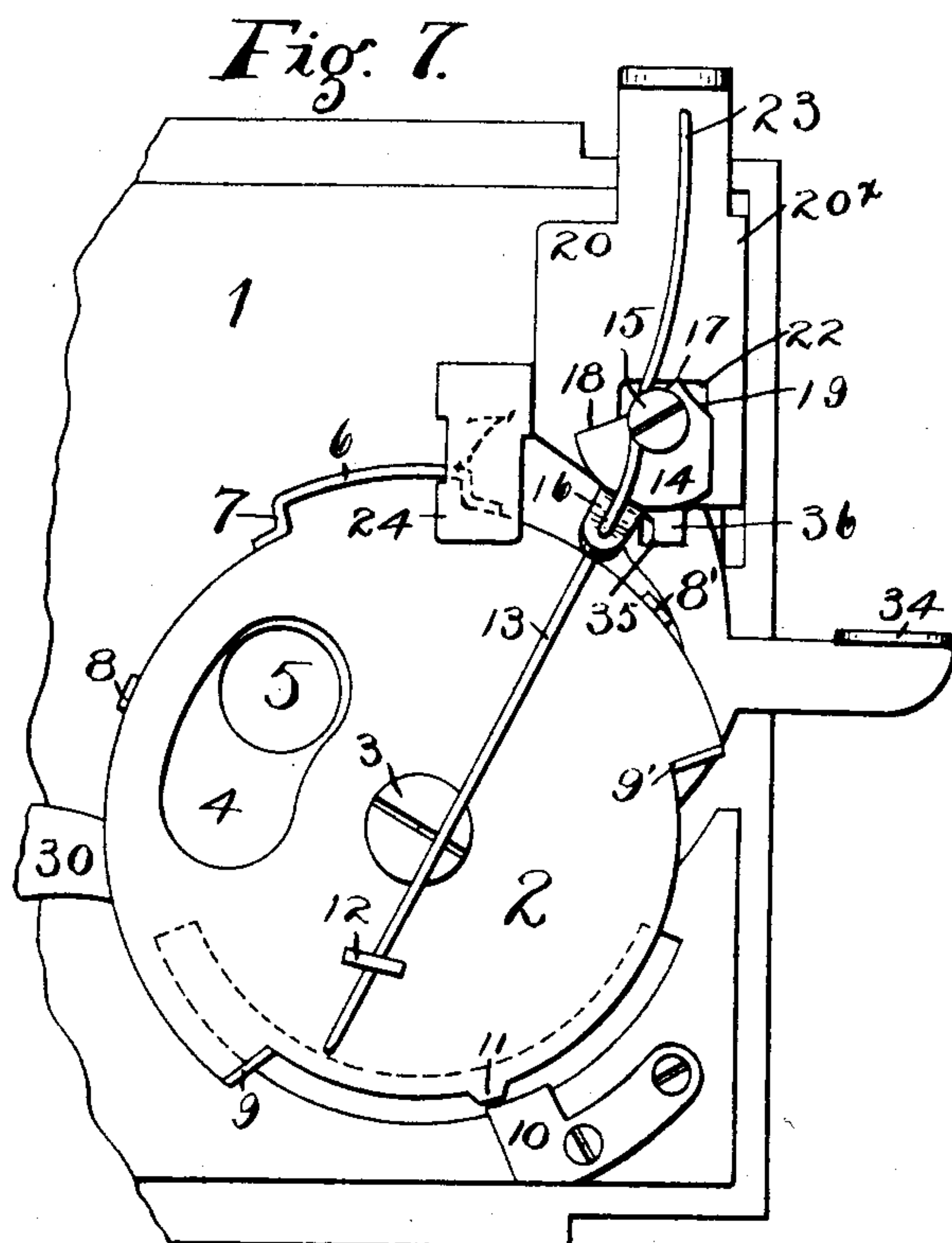
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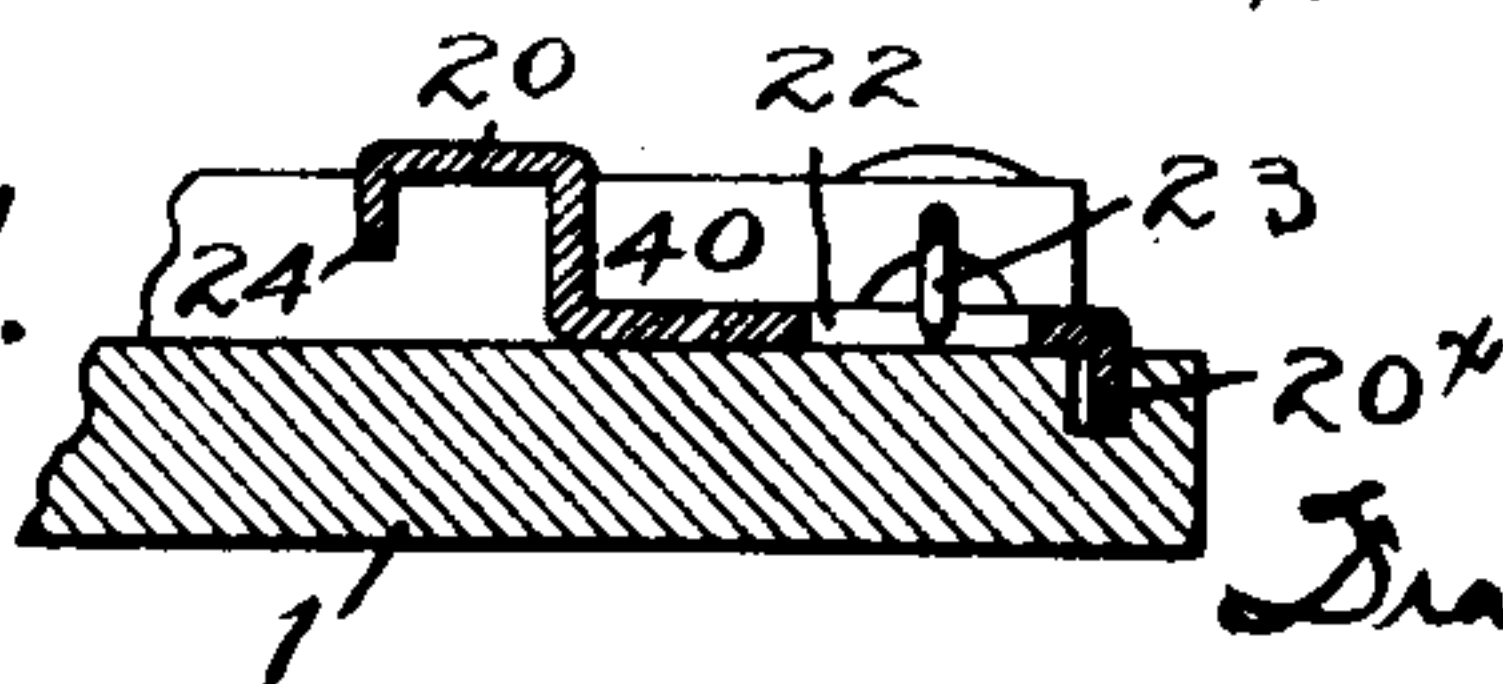
4 Sheets—Sheet 3.



Witnesses.

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Fig. 11.



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No. 610,154.

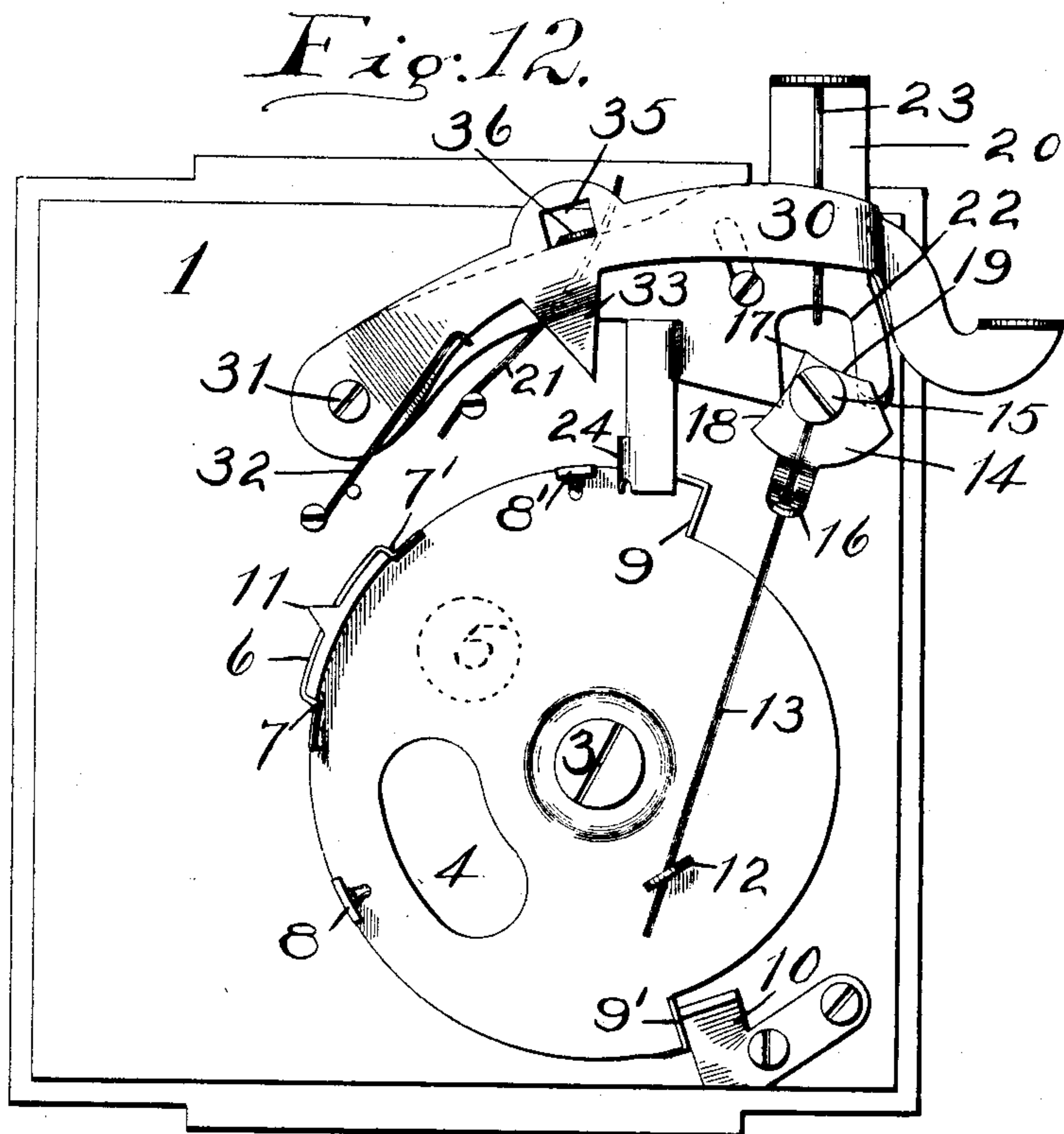
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(Model.)

4 Sheets—Sheet 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

FRANK A. BROWNELL, OF ROCHESTER, NEW YORK.

PHOTOGRAPHIC SHUTTER.

SPECIFICATION forming part of Letters Patent No. 610,154, dated August 30, 1898.

Application filed August 23, 1897. Serial No. 649,160. (Model.)

To all whom it may concern:

Be it known that I, FRANK A. BROWNELL, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Photographic Shutters; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

My present invention relates to that class of photographic shutters particularly adapted for use in cameras containing rollable film and which can be loaded or set and released without the necessity of opening the lens-aperture during the setting; and it has for its object to provide a shutter capable of being operated by successive movements of a single part or operating member in one direction and also to provide a shutter in which successive time exposures may be made by the operation of a single operating part or member, and, further, to improve and simplify the construction and operation of the parts.

To these and other ends the invention consists in certain improvements hereinafter fully described, the novel features being pointed out in the claims at the end of this specification.

In the accompanying drawings, Figure 1 is an elevation of a shutter constructed in accordance with my invention; Fig. 2, a similar view showing the position of the parts when opening the lens-aperture for a time exposure; Fig. 3, a view showing the position of the shutter after the completion of the movement of the shutter shown in Fig. 1; Fig. 4, a view showing the lens-aperture open for a time exposure after the operation shown in Fig. 2; Fig. 5, a view showing the position of the parts at the moment of the release of the shutter after the time exposure in Fig. 4; Fig. 6, a view showing the position of the parts when the time-stop is pressed down to make a time exposure with the shutter moving to the left; Fig. 7, a view showing the position of the parts after the time-stop has been released, the lens-aperture being open and the shutter ready to continue the motion to the left; Fig. 8, a plan view of the movable shutter member removed; Fig. 9, a sectional view

on the line $x x$ of Fig. 1; Fig. 10, a sectional view on the line $y y$ of Fig. 1; Fig. 11, a sectional view on the line $z z$ of Fig. 1; Fig. 12, 55 a view of a modification.

Similar reference-numerals indicate similar parts.

1 indicates the shutter support or plate, and 2 the oscillating shutter member, constructed, 60 preferably, of sheet metal, pivoted centrally upon a stud or pin 3, and adapted to vibrate in opposite directions alternately, so that the exposing-aperture 4 will pass across the lens or exposure opening 5 in the support. 65 This shutter is provided with the laterally-extending flange 6, having time stops or shoulders 7 7' at the ends thereof, and is also provided with lugs or stops 8 8', arranged on opposite sides of the stops 7 7' and at about 70 equal distances therefrom, and is also provided with stops or ears 9 9', constituting limiting-stops arranged to cooperate with a stationary stop 10, arranged upon the support 1, and is also provided with a lug or time-stop 11, and upon the face of the disk or shutter member is a perforated ear 12. 75

13 is the reversible actuating-spring cooperating with the ear 12 for throwing the shutter alternately in opposite directions, so as to 80 cause its aperture 4 to pass the lens-opening, said spring being connected to a plate 14, pivoted upon a pin 15 and having an ear 16, through which the spring extends, the extreme end of the spring in the present embodiment being coiled around the pin 15. 85

The plate 14 constitutes a switch-block and is provided with a pointed upper end 17, on opposite sides of which are the inclined surfaces or shoulders 18 and 19. 90

20 indicates a movable actuating member in the form of a plate guided to move vertically by a flange 20^x, operating in a groove in the support 1 and held by a cleat 40, said member being moved vertically away from 95 the shutter by means of the spring 21. This member is provided with an aperture 22, through which passes the pivot of the plate 14, carrying the spring 13, and upon it is mounted a flexible spring tongue or latch 23, 100 having its lower end bent downward to cooperate with the pointed end of the plate 14 and when the member is moved down to engage the shoulder 18 or 19, depending on the

direction in which said plate was last moved. The member 20 is also provided with a lug or projection 24, constituting a detent and extending over the face of the shutter and adapted to cooperate with the stops 7 7' 8 8' and with the flange 6, as will be described.

These devices are sufficient for throwing the shutter to make instantaneous exposures, and in order that this may be accomplished it is only necessary for the operator to press upon the flanged upper end of the actuating member 20, when, assuming the parts to be in the position shown in Fig. 1, the downward movement will cause the spring latch or tongue 23 to engage with the shoulder 18 on the switch-block 14, (the point 17 being to the right of the tongue,) turn the plate 14, and flex the spring 13, putting it under tension, with a tendency to move the shutter in the direction of the arrow in Fig. 1; but the detent 24 engages the stop 8 on the shutter, holding it stationary until by the continued downward movement the detent 24 moves below the stop, when, the spring being under full tension, the shutter will be thrown by it to the position in Fig. 3, the exposing-aperture therein having crossed the lens-opening and the shutter being arrested by contact of the stop 9 with the stationary stop 10. When the pressure on the movable member 20 is released, the spring 21 will raise it until the detent 24 is in the path of the stop 8' on the shutter, and the spring 13 having assumed the position shown in Fig. 3 it will be seen that the next downward movement of the member 20 will cause the latch 23 to engage the shoulder 19 on the oscillating switch-block 14, thereby flexing the spring 13 in the opposite direction and causing the aperture in the shutter to move across the lens-opening in the opposite direction when the detent 24 is disengaged from the stop 8' on the shutter.

It will be understood that each downward movement of the member 20 will cause the oscillation of the shutter, so as to cause an instantaneous exposure, the switch-block carrying the spring being oscillated in opposite directions alternately and the stops 8 8' on the shutter engaging with the detent 24 on the member 20 alternately.

To make time exposures, it is necessary that the aperture in the shutter shall be maintained coincident with the lens-opening, and in order to accomplish this by simple mechanism and by the reciprocation of a single actuating portion I provide a "time" member in the form of a lever 30, pivoted to the support at 31, moved upwardly by a spring 32 and having a projection 33, adapted when moved down to project in the path of and cooperate with the lug 11 on the rear side of the shutter. The free end of the member 30 is provided with a thumb-piece 34 and an upwardly-extended end provided with an aperture 35, in which operates a tongue 36, formed upon the movable member 20, as shown particularly in Fig. 10. The connection between

the time member 30 and the member 20 is a loose one, so that the latter may be manipulated to cause instantaneous exposures without operating the former; but when the member 30 is moved it will operate the member 20 to cause the flexing of the spring and release of the shutter.

Assuming the shutter to be in the position shown in Fig. 3, if the operator desires to open the lens-opening he presses upon the outer end of the member 30, thereby bringing the projection 33 in the path of the stop 11 on the shutter member, this movement operating the member 20 downwardly, flexing the spring 13, and withdrawing the detent 24 from the stop 8' and causing the shutter to move to the position in Fig. 2 with the flange 6 above the lug 24, and upon the release of the member 30 the spring 32 will move the latter upward and releasing the stop 11 and the detent 24 will engage the stop 7, holding the shutter with the aperture in line with the lens-opening, as in Fig. 4. In this position, it will be noted, the detent 24 on the member 20 is beneath the flange 6 on the shutter, and said member 20 is not permitted to move upward far enough to release the switch-block 14 from the latch, which latter is therefore held so that the next downward movement of the member 20 will move the spring 13 in the same direction as before. To close the shutter from this position, it is only necessary to move the member 20 downward far enough to disengage the detent 24 from the stop 7 and allow the spring 13 to throw the shutter to the position in Fig. 1. This releasing operation I prefer to accomplish by moving the time member 30 downward, as in Fig. 5, in order that both the operations necessary for a time exposure shall be accomplished by the movement of a single part, thus preventing confusion on the part of the operator.

If the shutter should be in the position in full lines in Fig. 1 when it was desired to make a time exposure, the first downward movement of the time member 30 will flex the spring 13 to the right, as in Fig. 6, the stop 8 and detent 24 cooperating until the spring 13 is under tension, the stop 33, projecting in the path of stop 11 on the shutter, arresting the latter with the flange 6 over the detent 24, and when the member 30 is released the shutter will be held by the engagement of stop 7' with lug 24, as shown in Fig. 7, the flange 6 preventing the release of the detent and maintaining the switch-block with the latch on the same side. The shutter may be closed from the position shown by manipulating the member 20 or member 30 to release the lug 24, as before described.

This shutter is particularly adapted for use on cameras used by amateur photographers, because there are no parts to be set or manipulated when time exposures follow instantaneous exposures, or vice versa, it being only necessary to press upon the instantaneous member once to make an instantaneous ex-

posure and to press the time member once to open and again to close the shutter no matter in what position the shutter was left after the last operation.

5 It will be understood that it is not necessary that the member 20 be in the form of a sliding plate or that the time member 30 be in the form of a lever, as these constructions could be changed or reversed.

10 Other modifications will also readily occur to those skilled in the art, and I therefore do not desire to be confined to the details of the construction shown, as I regard this as but one embodiment of my invention.

15 In Fig. 12 I have shown a modification of my invention in which both the member 20 and the time member 30 are in the form of levers, the operations in this arrangement being the same as the one described and the
20 stop 11 being removed to above the flange 6 owing to the changed location of the lever 30.

I claim as my invention—

1. The combination with an oscillatory shutter, of a reversible motor-spring, a movable member, a spring for actuating it in one direction, connections between said member and the spring for tensioning the latter upon opposite sides of the shutter alternately when said member is moved in one direction only,
25 and a detent controlled by the member for engaging the shutter and releasing it when the member is moved in one direction.

2. The combination with an oscillatory shutter, of a reversible motor-spring engaging the shutter, a movable member, a latch and switch-block arranged between the member and motor-spring for causing the reversal of the spring by successive operations of the member in one direction, and a detent
35 controlled by the member for holding and releasing the shutter.

3. The combination with an oscillatory shutter, of a reversible motor-spring engaging the shutter, a movable member, a switch-block connected to the spring, a latch on the member cooperating with the switch-block, and a detent for holding and releasing the shutter operated by the movable member.

4. The combination with an oscillatory shutter, of a pivoted switch-block, a spring thereon operating on the shutter, the movable member having the spring-latch thereon cooperating with the switch-block, and a detent for holding and releasing the shutter actuated by the movable member.
50

5. The combination with an oscillatory shutter having the stops 8 and 8', of the movable member having the detent 24, the spring for moving the member in one direction, a reversible motor-spring engaging the shutter, and a switch connection between said member and spring for tensioning the latter in opposite directions by successive movements of the member in the same direction.

65 6. The combination with an oscillatory shutter, of a reversible actuating-spring con-

nected thereto, a pointed switch-block to which the spring is connected, a movable member, a spring-latch carried by the member and cooperating with the block to oscillate it in opposite directions alternately, and a detent engaging the shutter and controlled by the movable member. 70

7. The combination with an oscillatory shutter, of a reversible actuating-spring connected thereto, a pivoted support connected to the spring, a movable member, connections between the member and support for operating the latter in opposite directions alternately by the successive movements of the member in the same direction, and a detent for the shutter controlled by the movable member. 75 80

8. The combination with an oscillatory shutter, of spring-actuating devices for operating the shutter in opposite directions alternately, a movable member, connections between the movable member and actuating devices for causing the latter to cooperate with opposite sides of the shutter alternately by successive movements of the member in the same direction, and holding devices for the shutter released by the movement of the member. 85 90

9. The combination with an oscillatory shutter having the stops 8, 8', the reversible actuating-spring, and the pivoted pointed switch-block connected to the spring, of the movable member having the spring-latch cooperating with the switch-block, and the detent operated by the movable member and cooperating with the stops on the shutter. 95 100

10. The combination with a support having a lens-opening and an oscillatory apertured shutter, of spring-actuating devices for operating the shutter in opposite directions alternately, a movable member, connections between the movable member and the spring-actuating devices for causing the latter to cooperate with opposite sides of the shutter alternately by successive movements of the member in the same direction, holding devices for the shutter released by the movement of the member, a time member connected to the movable member to actuate it in one direction and cooperating with the shutter for arresting the latter with the aperture in line with the lens-opening. 105 110 115

11. The combination with a support having a lens-opening and an apertured oscillatory shutter, of a reversible shutter-actuating motor for moving the shutter in opposite directions, a movable member, a spring for actuating it in one direction, connections between said member and the motor for operating the latter in opposite directions alternately when the member is moved in one direction only, a detent controlled by the member for engaging the shutter and releasing it by the continued movement of the member in one direction, a time member connected to and actuating the movable member and having a 120 125 130

portion cooperating with the shutter to arrest it with the aperture in line with the lens-opening.

12. The combination with a photographic shutter, an actuating-spring for operating it, a movable member, connections between said member and the spring for tensioning or setting the latter, and a detent controlled by the member for holding and releasing the shutter, of a movable time member cooperating with the first-mentioned member to move it, and connections between said time member and the shutter for holding the latter open.

13. The combination with an oscillatory apertured shutter, a reversible actuating-spring cooperating therewith, a movable member, connections between said member and the spring for flexing the spring in opposite directions alternately at each movement of the member in one direction, and a detent operated by the member for engaging and holding the shutter against the tension of the spring and releasing it, of a movable time member adapted when operated to arrest the shutter intermediate the extremes of its oscillations, and connections between said time member and the first-mentioned member for operating the latter when the time member is operated.

14. The combination with an oscillatory apertured shutter, a reversible actuating-spring cooperating therewith, a movable member, and a latch and switch connection between the member and spring for flexing the spring in opposite directions at each movement of the member in one direction, of a detent actuated by the member for holding and releasing the shutter, a movable time member cooperating with the shutter to hold it intermediate the extremes of its oscillations, and connections between the first-mentioned member and the time member for actuating the former by the movement of the latter.

15. The combination with a movable apertured shutter, a spring for operating it, means for placing the spring under tension, and a

detent for holding the shutter, of a time member cooperating with the shutter to arrest it intermediate the extremes of its movement, and connections between said time member, the spring-tensioning device and the detent for tensioning the spring and releasing the detent when the time member is operated to arrest the shutter.

16. The combination with a movable apertured shutter having the stops 7, 7', 8, 8', and 11, and the flange 6, of the spring 13, the movable member having the detent cooperating with the stops, the spring for moving the member in one direction, connections between the movable member and the spring for tensioning the latter in opposite directions alternately, the time member cooperating with the stop 11, and having the loose connection with the movable member to operate it.

17. The combination with the apertured oscillatory shutter, spring-motor devices for operating the shutter in opposite directions alternately, a movable member, a shutter-detent operated thereby, and connections between said member and the motor devices for placing the latter under tension on opposite sides of the shutter alternately, and releasing the detent at each successive movement of the member in one direction, of a time member having a loose connection with the first-mentioned member, and adapted to cooperate with the shutter to arrest it intermediate the extremes of its movement.

18. The combination with the apertured oscillatory shutter having the stops 7, 7', 8, 8', and 11, and flange 6, the movable member having the detent, the shutter-spring 13, and the switch and latch connection between the spring and member, of the pivoted lever 30 having the arm 33, the spring for operating the lever, and a loose connection between the lever 30 and the movable member.

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Witnesses:

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