

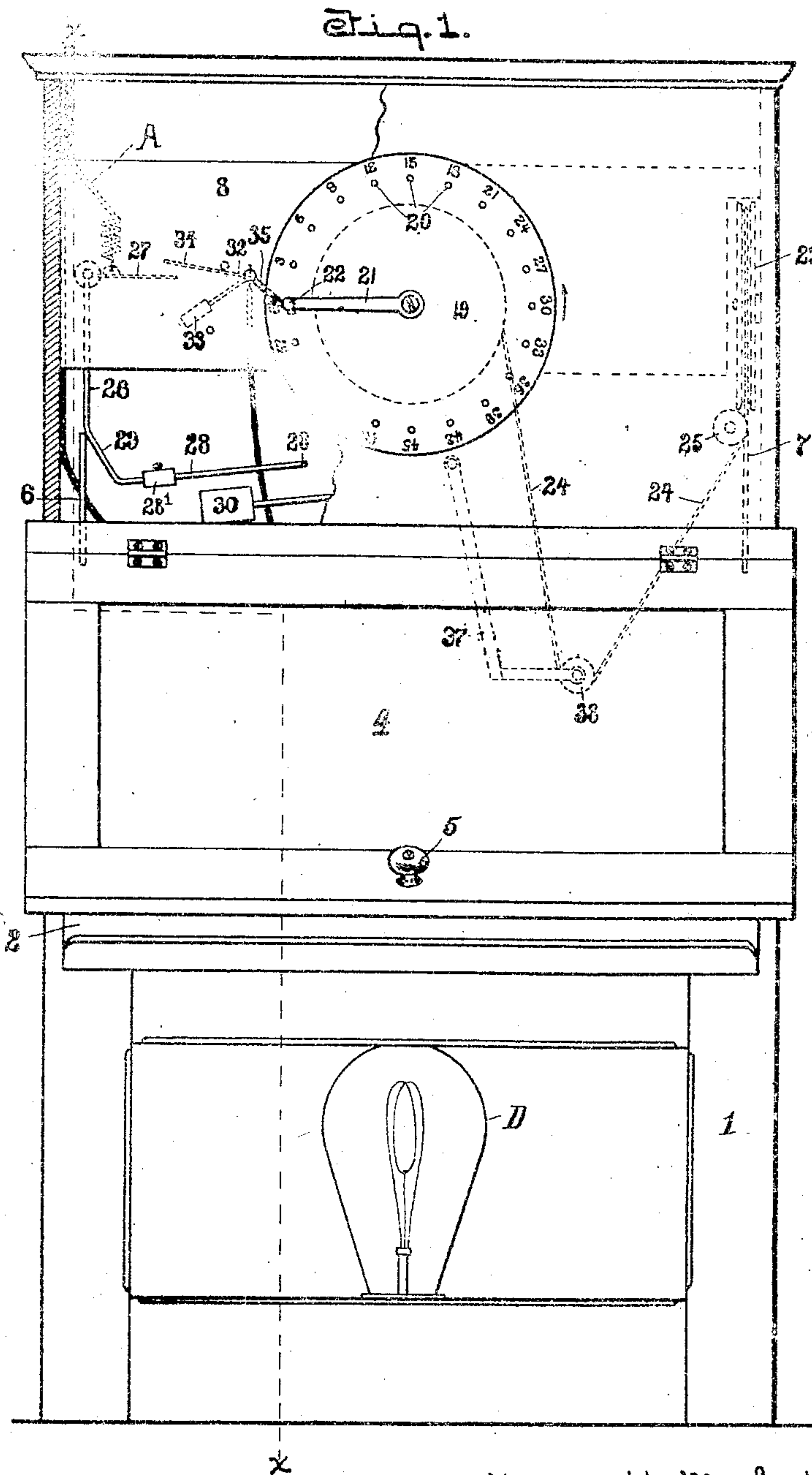
No. 361,602.

PATENTED JULY 30, 1907.

H. H. McINTIRE.
PHOTOGRAPHIC PRINTING APPARATUS.

APPLICATION FILED FEB. 2, 1903.

3 SHEETS—SHEET 1.



Witnesses:

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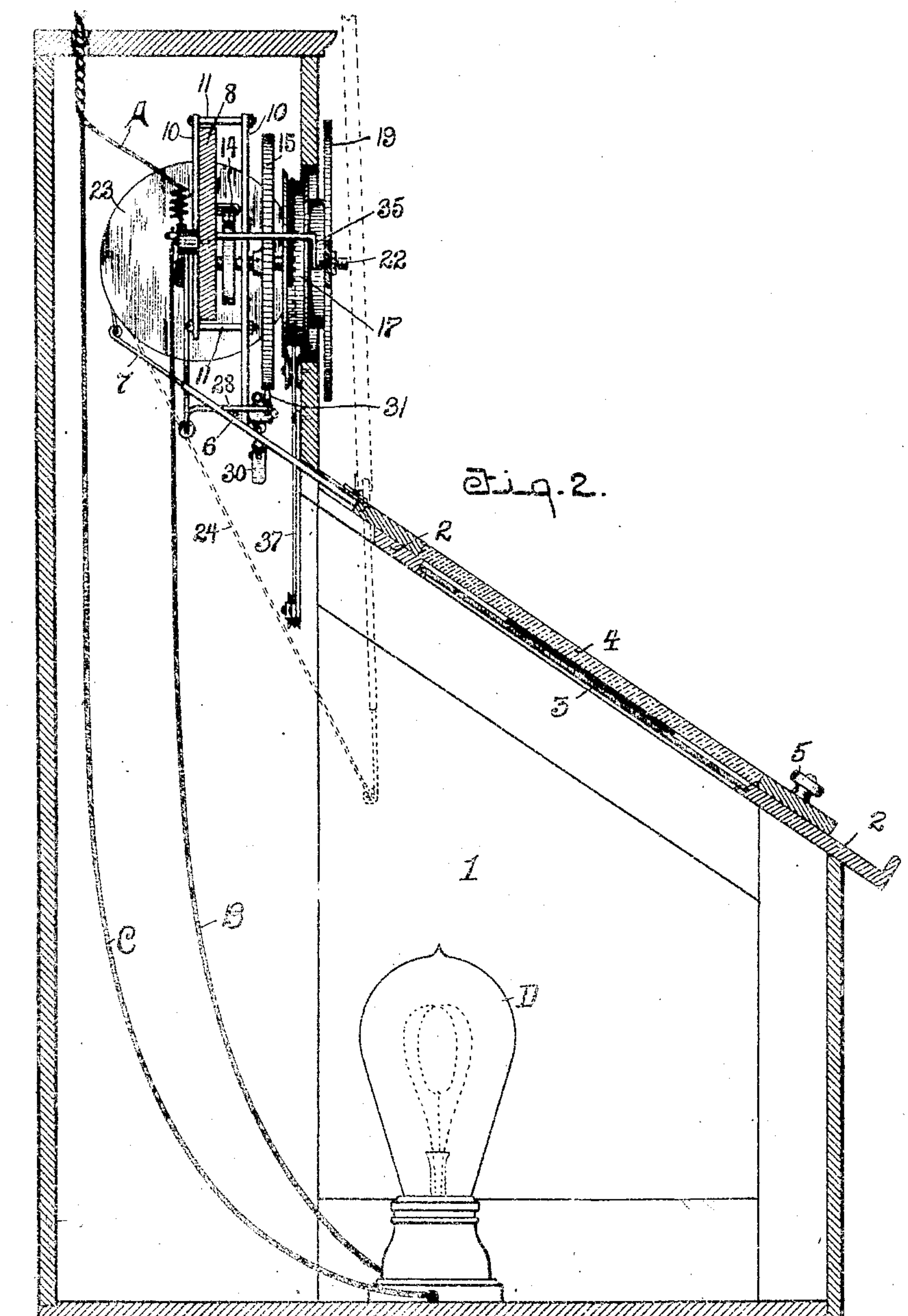
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3 SHEETS--SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 3.

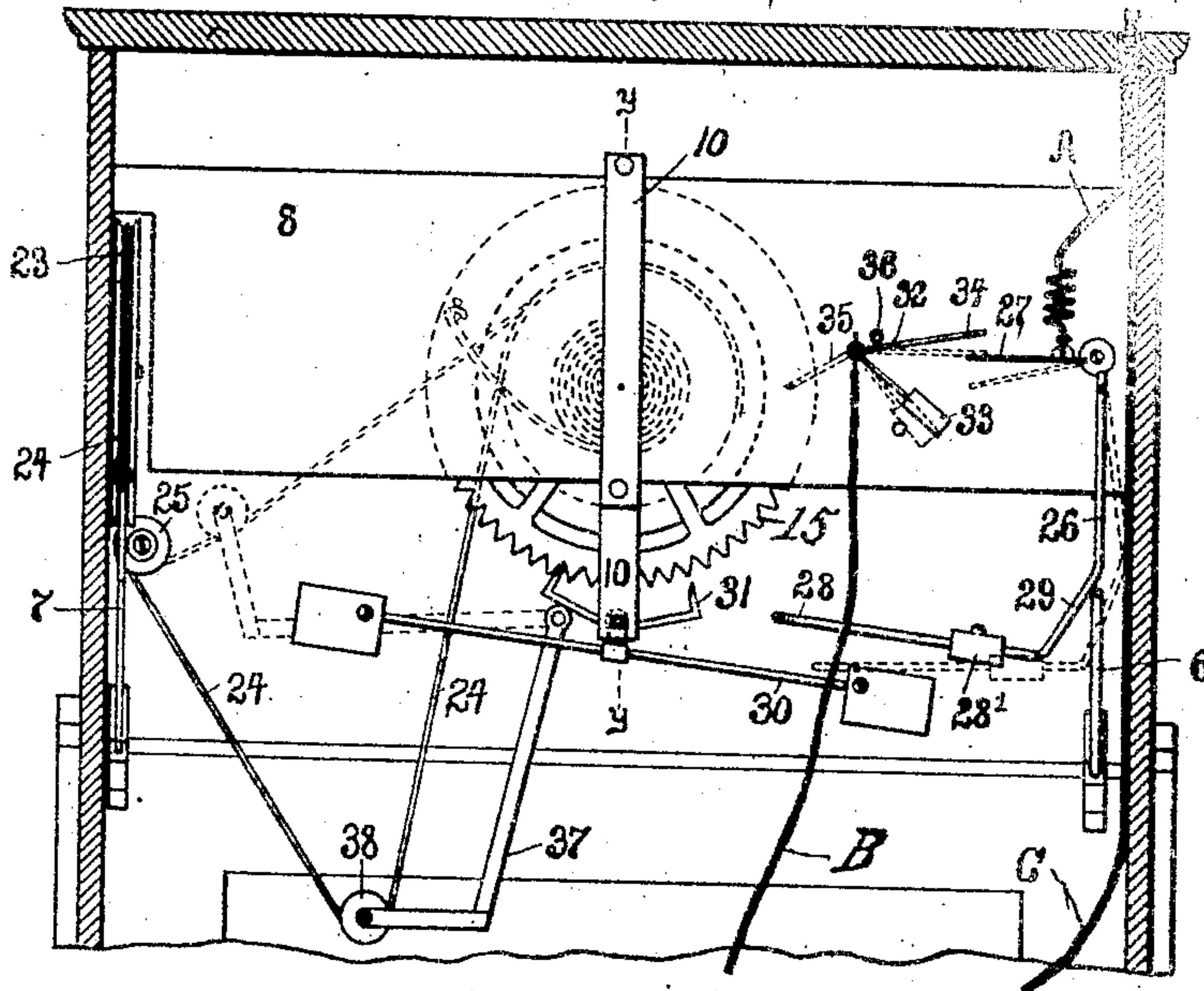


Fig. 4.

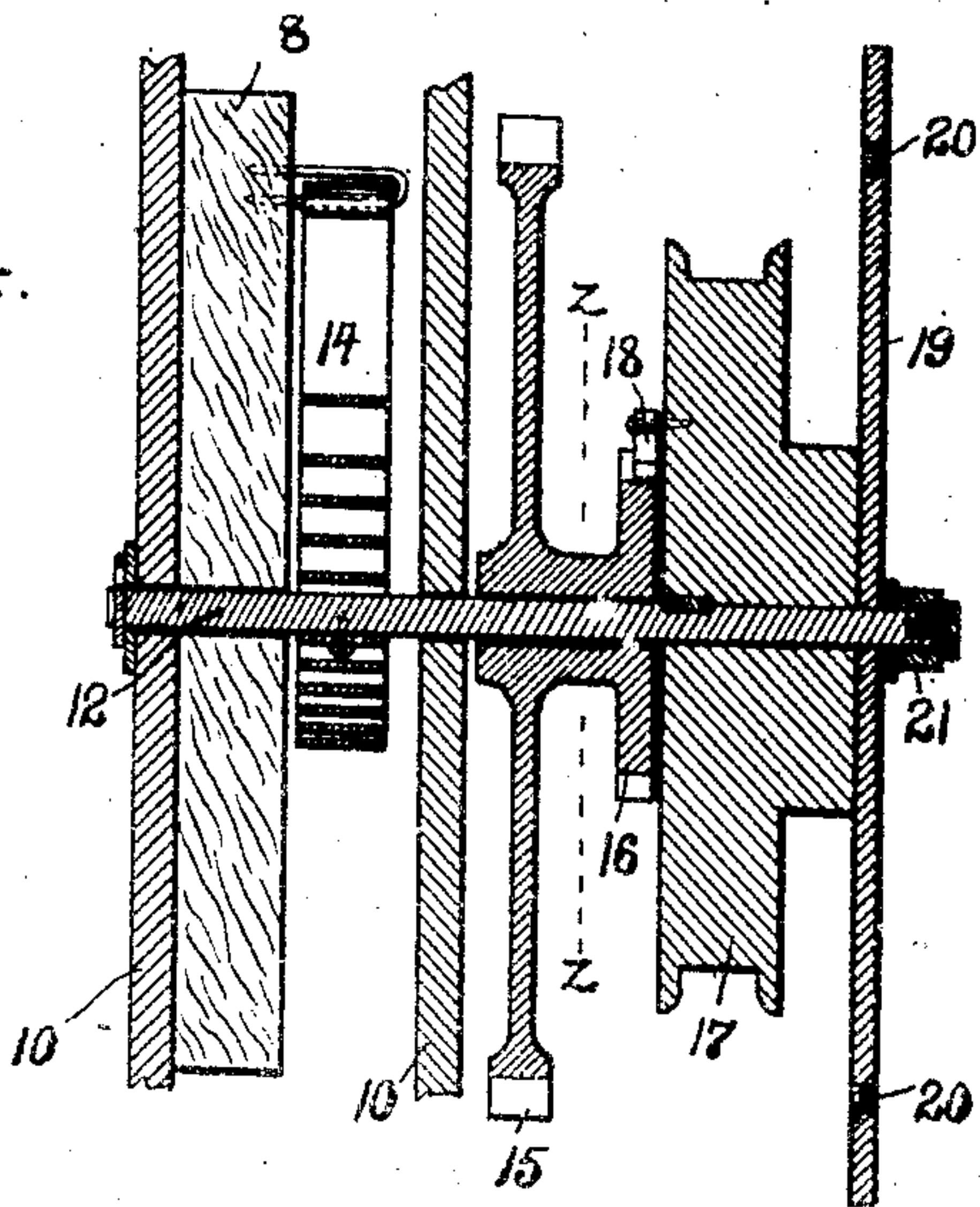
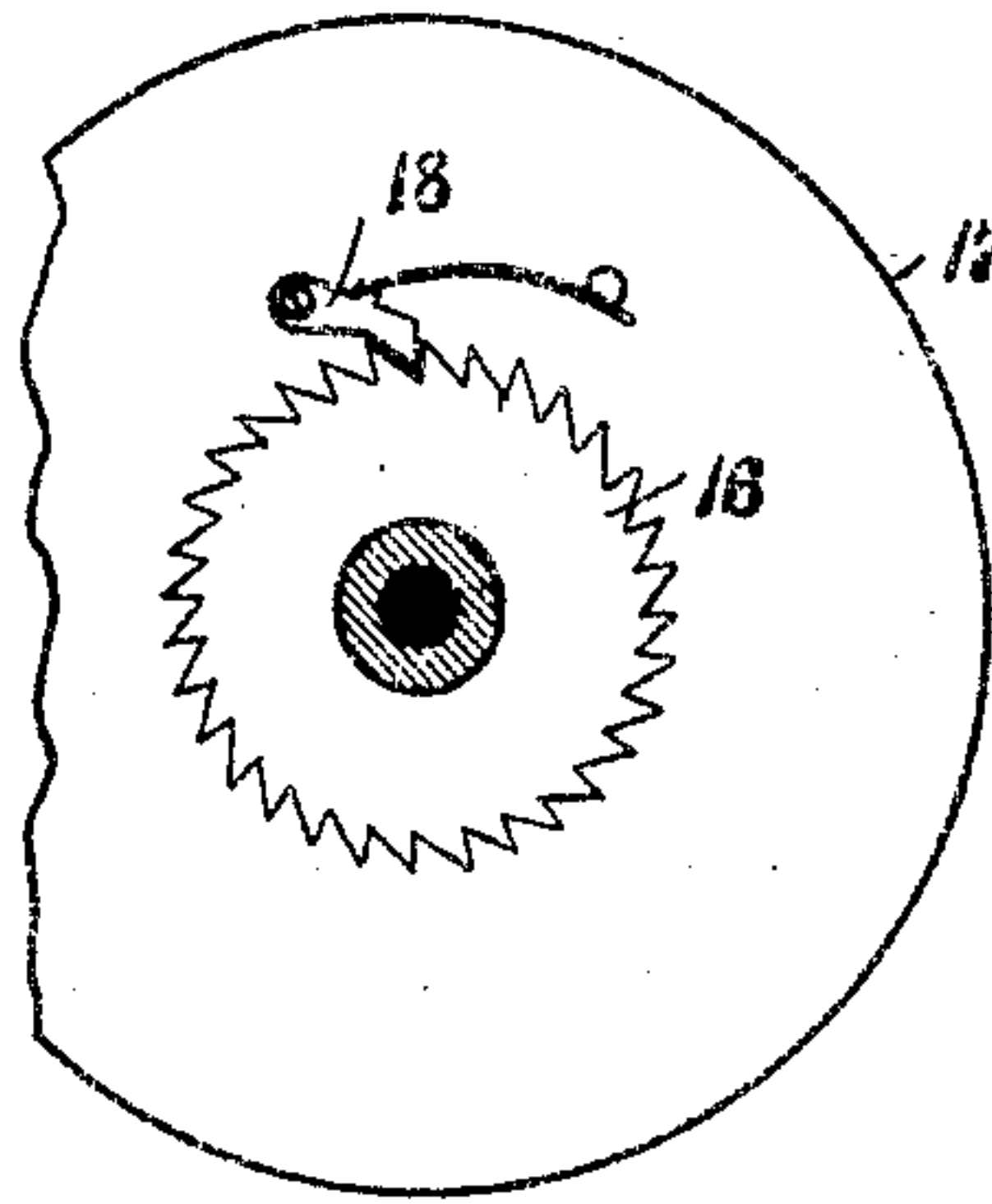


Fig. 5.



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UNITED STATES PATENT OFFICE.

HERVEY H. MCINTIRE, OF SOUTH BEND, INDIANA.

PHOTOGRAPHIC-PRINTING APPARATUS.

No. 861,602.

Specification of Letters Patent.

Patented July 30, 1907.

Application filed February 2, 1903. Serial No. 141,542.

To all whom it may concern:

Be it known that I, HERVEY H. MCINTIRE, a citizen of the United States, residing at South Bend, in the county of St. Joseph and State of Indiana, have invented certain new and useful Improvements in Photographic-Printing Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in photographic printing apparatus.

The object of the invention is to provide a machine of the kind named and for the purposes intended which is simple in construction, positive and efficient in its operation, and wherein the duration of time for each exposure is automatically controlled and accurately recorded and the mechanisms for effecting these purposes reset at each operation.

The invention embodies a case in which the negative is mounted and to which the photographic paper is held to be acted upon by a light emitted for a predetermined period, a motor in the case, a dial operated by the motor, and mechanisms for restoring the motor with power and cutting off the light at each operation.

With these and other objects in view the invention consists in the novel construction, combination and aggroupment of parts, all as will be more fully described hereinafter and finally pointed out in the appended claims.

In the accompanying drawings forming part of this application:—Figure 1 is a front elevation of the machine with a portion of the case broken away to show the pendulum controlling lever and the depending arm on the platen. Fig. 2 is a side view with the left side of the case removed to show the motor and its operating mechanisms in side elevation. Fig. 3 is a rear elevation of the upper part of the case with the back removed to show the mechanisms in elevation. Fig. 4 is a vertical section through the motor, and Fig. 5 is a section on the line *z—z* of Fig. 4.

In carrying out the invention, the essential parts of the machine are mounted in any convenient form of cabinet, but the preferred embodiment is shown in the drawings as composed of a rectangular case 1 having at its front an inclined bed-plate 2 provided with an opening in which the negative 3 is detachably posited.

Hinged to the bed-plate at the upper end thereof is a platen 4 between which and the negative the photographic sensitive element is placed, and held during the printing operation. The lower end of the platen is provided with a knob 5 by which it may be lifted and from the upper end and near each corner project arms 6 and 7 the purposes for which will presently appear.

Across the top of the case above the bed-plate is

secured a plate 8 on which is supported a rectangular frame composed of the vertical bars 10 and horizontal end pieces 11. Journaled in the vertical bars 10 is a shaft 12 of a spring motor and on the shaft is a coil spring 14 one end of which is secured to the plate 8 and the other end to the shaft. Loosely mounted on the shaft is an escapement wheel 15 having a ratchet wheel 16 integral with its hub. A pulley wheel 17 is splined on the shaft in front of the escapement wheel and provided with a spring pressed pawl 18 adapted to engage the ratchet wheel 16, and by means of which the escapement wheel 15 is clutched to the shaft. A dial 19 is fixed on the shaft to rotate with the pulley 17 and around the dial are arranged a plurality of apertures 20 spaced at equal distances apart to divide the dial into units of time which are indicated by numerals opposite each aperture and which in the present drawing are shown to include sixty of such units representing sixty seconds. On the front end of the shaft is mounted an indicator arm 21, rotatable independently of the dial and having a pin 22 in its end adapted to project through the apertures to the opposite side of the dial.

On one side of the case is mounted a pulley 23 over which a cord 24 passes, one end of the cord being secured to the arm 7 and its other end passed around the pulley 17. A guide roller 25 is mounted on the front of the case in the same plane with the pulley 17 so that when the platen is lifted and its arm 7 thrown down the cord 24 will roll around the pulleys 23 and 25 and rotate the pulley 17 and its shaft 12 to which the dial and spring 14 are secured. This will rewind the spring to restore the power for the motor and at the same time rotate the dial, while the escapement wheel 15, which is locked by a mechanism hereinafter to be described, will remain stationary, since the pawl 18 will ride over the ratchet.

On the plate near one side of the case is mounted a switch lever 26 having an upper horizontal arm 27 and a lower horizontal arm 28 bent forwardly and provided with a weight 28'. The angle formed by the lower horizontal arm 28 and the vertical portion of this lever is slightly inclined as at 29 to provide a bearing surface for the arm 6 which lifts the lever when the platen is lowered.

To the upper horizontal arm 27 is connected an electric conductor A, and in the bottom of the case is an electric lamp D which is supplied by the conductors B and C. The forwardly bent arm 28 forms an obstruction to the pendulum when the platen is raised, as shown in dotted lines in Fig. 3.

The pendulum 30 is pivoted to the end of the bar 10 and oscillates the pallet 31 which controls the escapement wheel 15.

To the plate 8 is pivoted a lever 32 having a weighted arm 33 and a contact arm 34 adapted to engage the arm

110

27 of the switch lever; and extending forwardly in the path of the pin 22 on the indicator arm is a crank arm 35 which is integral with the lever 32 and which is engaged by said pin to trip the lever and break the electric circuit, as shown in dotted lines in Fig. 3, said circuit being completed by the conductor B which is bound to the lever 32, as shown.

In order to stop the dial when the lever has been tripped a stop 36 is provided to be engaged by the contact arm 34 and when this takes place the circuit is broken and the light shut off and the pendulum and pallet discontinue to operate because the dial, to which it is clutched by the pawl and ratchet, is locked against rotation by the crank arm 35. Immediately upon raising the platen the arm 6 will be disengaged from the switch lever which will be permitted to drop to engage the pendulum and hold one end of the pallet in contact with the escapement wheel, as shown in Fig. 3.

To the front of the case beneath the pulley 17 is pivoted an arm 37 having a roller 38 around which the winding cord 24 passes. This arm takes up the slack in the cord which is of sufficient length to permit the platen to be fully raised without rotating the dial, but when the platen is thus raised and the indicator arm moved to a point on the dial (say 15) and the platen lowered, the dial will make a quarter revolution and draw up one fourth of the slack in the cord so that when the platen is again raised that portion of the cord which was wound on the pulley will be utilized to reset the dial to the point 15 and repeat the operation at each movement of the platen.

The operation of the machine may be briefly stated as follows:—Presuming the parts to be in positions indicated in Fig. 1 with the platen lowered, the electric circuit broken, the entire length of the cord unwound and the indicator arm set at 60, the starting point; and it be desired to print from a negative requiring thirty seconds exposure. The platen is raised to its highest position, as shown in dotted lines in Fig. 2, and the slack in the cord is taken up and the arm 37 raised to the position indicated in dotted lines in Fig. 3. Simultaneously with this operation the arm 6 on the platen disengages from the switch lever 26 which drops into the path of the pendulum as shown in dotted lines in Fig. 3 thereby locking the pallet in the escapement wheel. Now the indicator arm is turned and set at 30 and the crank-arm 35 being released, the arm 34 of the lever 32 is permitted to drop to the position indicated in dotted lines in Fig. 3. The platen is now lowered with the sensitive element in position on the negative, and the arm 6 engages the switch lever 26 to make the electric connection between the arms 27 and 34 which turns on the light, while the forwardly bent portion of the arm 28 is raised out of the path of the pendulum which immediately begins to operate and turn the dial until the pin in the indicator arm has engaged the crank arm 35 which, as will be seen, acts as a stop for the dial as well as a trip arm for the electric switch. When this has been accomplished one half of the slack in the cord has been wound on the pulley 17 and as much of the spring unwound as is required to wind up one half of the cord, so that when the platen is again raised the dial will be turned back to the same starting point or will be rotated one half of a revolution. The operation may then be continued to print as many pictures as

desired and each will be exposed the same length of time. Obviously the dial may be set for any number of units of time between the marks 0 and 60 by the operation above described.

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

1. In a photographic printing apparatus, a case having a source of light therein and provided with means to hold a negative and a sensitized element, a platen, and a motor in the case controlled by the movements of the platen. 75
2. In a photographic printing apparatus, a case having a source of light therein and provided with means to hold a negative and a sensitized element, a motor in the case, a platen controlling the operation of the motor, and means independent of the platen to automatically stop the motor and extinguish the light. 80
3. In a photographic printing apparatus, a case having a source of light therein and provided with means to hold a negative and a sensitized element, a motor in the case, means for stopping the motor, said means also operating to extinguish the light synchronously with the stopping of the motor. 85
4. In a photographic printing apparatus, a case having a source of light therein and provided with means to hold a negative and a sensitized element, electric conductors within the case to supply the light, a motor in the case, a switch operated by the motor to break the electric circuit and simultaneously stop the motor, and a platen to restore the motor and re-set the switch. 90
5. In a photographic printing apparatus, a case having means to hold a negative and a sensitized element, a motor in the case, a platen to control the operation of the motor and to control the admission of light to the negative, and means for operating the motor for a predetermined period. 95
6. In a photographic printing apparatus, a case having means to hold a negative and a sensitive element, a vibratory platen, a motor, means for intermittently emitting light to the negative at each operation of the platen, means for changing the period of operation for the motor, and means to lock the motor at the end of the period of operation. 100
7. In a photographic printing apparatus, a case having means to hold a negative therein, a vibratory platen to hold the photographic paper on the negative, means to intermittently emit light to the negative, a motor in the case, means operated by the movements of the platen to restore the motor with power, means to hold the motor locked against operation during the period of restoration, and means for changing the period of operation of the motor. 105
8. In a photographic printing apparatus, a case having means to hold a negative therein, a vibratory platen to hold the photographic paper on the negative, and means to intermittently emit light to the negative, a motor, means operated by the movements of the platen to restore the motor with power, means operated by the platen to lock the motor against operation during the period of restoration, means operated by the motor to shut off the light, said last named means acting to stop the motor, and means to change the period of operation for the motor to regulate the time of exposure for each picture. 110
9. In a photographic printing apparatus, a case having means to hold a negative therein, a motor in the case, a vibratory platen provided with an arm, a connection between the arm and the motor to restore the latter with power when the platen is operated, a dial operated by the motor and having means to regulate the rotation of the same, a lamp in the case, electric conductors connected with the lamp, and an electric switch operated by the dial-regulating-means to break the circuit and stop the motor at the completion of the printing operation. 115
10. In a photographic printing apparatus, a case having means to hold the negative, means to intermittently emit light to the negative, a motor in the case, a vibratory platen provided with an arm, a flexible connection between the arm and motor, means to take up the slack in the flexible connection, a dial operated by the motor and having its face divided into units of time, an arm on the dial 120

adapted to be set at any one of the units to limit the rotation of the dial, an electric lamp in the case provided with conductors, a switch lever to make and break the electric circuit and adapted to be operated by the arm on the dial, and means carried by the platen to lock the motor against operation when the platen is raised.

11. In a photographic printing apparatus, a case having means to hold a negative therein, a spring motor in the case, a platen hinged to the case and adapted to be raised and lowered, an arm on the platen having a flexible connection with the motor to restore the same with power when the platen is raised, a pivoted arm hung upon the flexible connection to take up the slack in the same, a dial operated by the motor and provided with apertures spaced apart there-around to represent units of time, an arm having a pin to engage the apertures, a lamp in the case adapted to be intermittently lit, electric conductors for said lamp, a switch lever connected with one of said conductors and having a depending arm, an arm on the platen to engage the depending arm of the switch lever, a lever having a crank arm adapted to be engaged by the pin in the indicator arm at the completion of the movement of the dial, said lever adapted to contact with the switch lever to break the electric circuit and stop the motor, substantially as described.

12. In a photographic printing apparatus, means for holding a negative and a sensitized element, means for emitting light to the negative and sensitized element, a motor to control the light emitting means, means for holding the sensitized element to the negative and releasing the same therefrom, and means operated by the last-mentioned means for controlling the operation of the motor.

13. In a photographic printing apparatus, means for holding a negative and a sensitized element, means for intermittently emitting light to the negative and sensitized element, a movable platen, an intermittently operated motor to control the light emitting means, means for predetermining the period of operation of the motor, means for changing the period of operation of the motor, and means operated by the platen to restore the motor with power.

14. In a device of the class described, a case adapted to contain a source of light and provided with means for holding a negative, means operating to hold a sensitized element in contact with the negative during the printing operation, mechanism cooperating with the last-named means for synchronizing its operation with the admission of light to the negative, and a single means adapted to be set to predetermine the period of operation for said synchronized elements.

15. In a photographic printing apparatus, a case having means for holding a negative and a sensitive element therein, said case containing a source of light, a motor, and movable means for giving access to the sensitive element, said means having a connection with the motor to energize and start the same and also having a connection with the lighting means to extinguish the light thereof.

16. In a photographic printing apparatus, a case having

means to hold a negative and also having a source of light, means for intermittently emitting light onto the negative, and an intermittently operated motor to regulate the emission of light to the negative.

17. In a photographic printing apparatus, a case having a lamp therein intermittently lighted, an intermittently operated motor to regulate the lighting of the lamp, and means for controlling the operation of the motor.

18. In a photographic printing apparatus, a case having a lamp therein intermittently lighted, an intermittently operated motor to regulate the lighting of the lamp, and means to change the period of operation of the motor.

19. In a photographic printing apparatus, a case having means to hold a negative and also having means for intermittently emitting light on the negative, a movable platen, a motor to regulate the emission of light, and means operated by the movable platen to restore the motor with power.

20. In a photographic printing apparatus, a case having a source of light therein, an intermittently operated motor to regulate the emission of light, and means to predetermine and change the period of operation of the motor.

21. In a photographic printing apparatus, a case having a source of light, means for intermittently emitting light to the negative, said case also having means for holding a negative and a sensitized element, a movable platen, a motor, and means operated by the platen to lock the motor against operation.

22. In a photographic printing apparatus, a case having a source of light, means to hold a negative and a sensitized element therein, a movable platen, a motor to regulate the emission of light to the negative, and means operated by the platen to lock the motor against rotation and extinguish the light.

23. In a photographic printing apparatus, a case having a source of light, means to hold a negative and a sensitized element therein, a movable platen, a motor to regulate the emission of light to the case, means operated by the platen to restore the motor with power, and means operated by the platen to lock the motor against operation during the period of restoration.

24. In a photographic printing apparatus, a case having a source of light therein, a movable platen, and an intermittently operated motor in the case controlled by the movements of the platen to regulate the emission of light to the case.

25. In a photographic printing apparatus, a case having a source of light therein, means for holding a negative and a sensitized element therein, a movable platen, and a motor controlled by the movements of the platen to regulate the emission of light to the case.

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

HERVEY H. MCINTIRE.

Witnesses:

GEORGE OLTSCHE,
MAGGIE OLTSCHE.