

No. 741,723.

PATENTED OCT. 20, 1903.

F. W. SCHNEIDER.  
ELECTRIC TIME CONTROLLER.

APPLICATION FILED JAN. 30, 1902.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1.

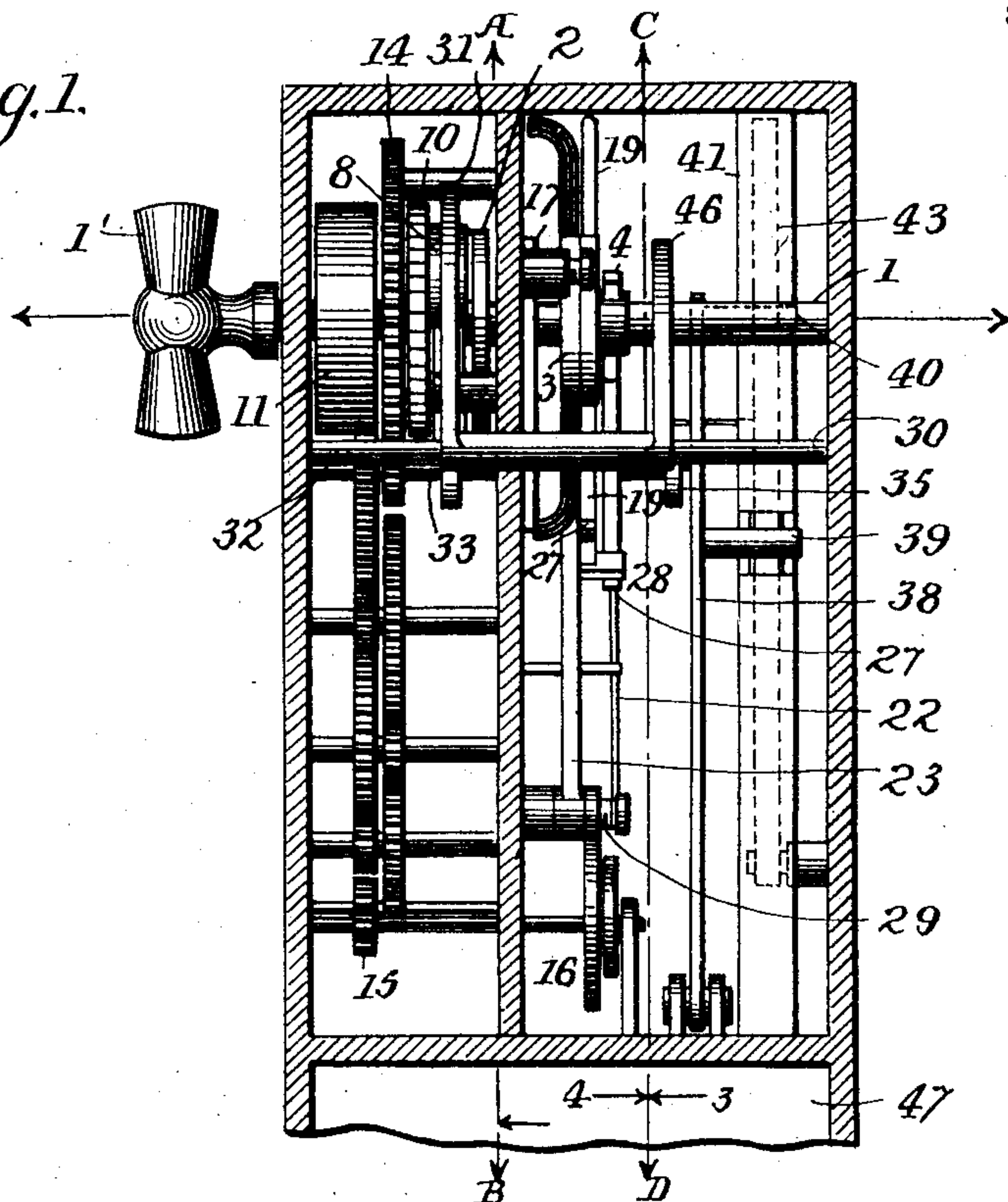
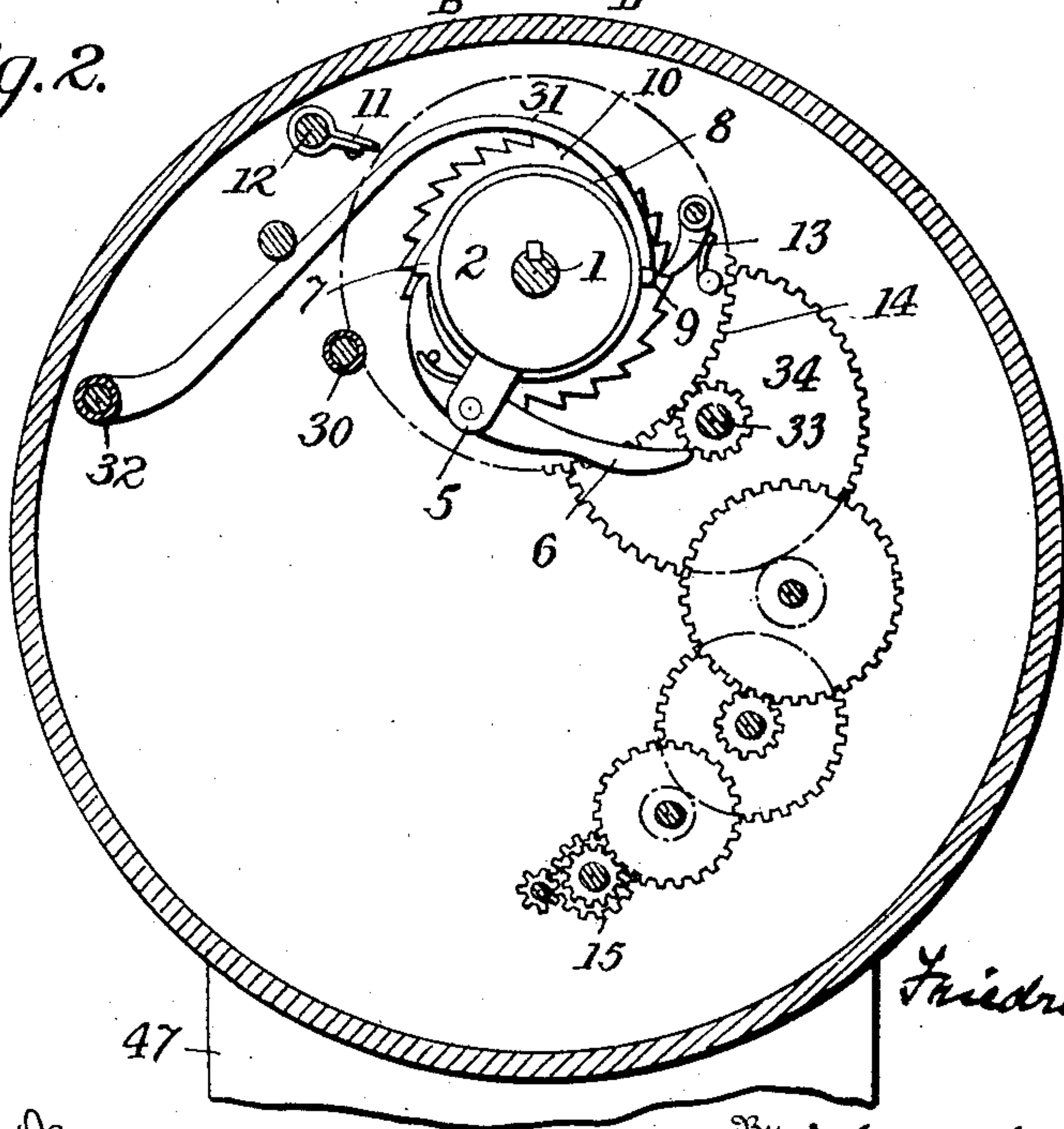


Fig. 2.



Witnesses

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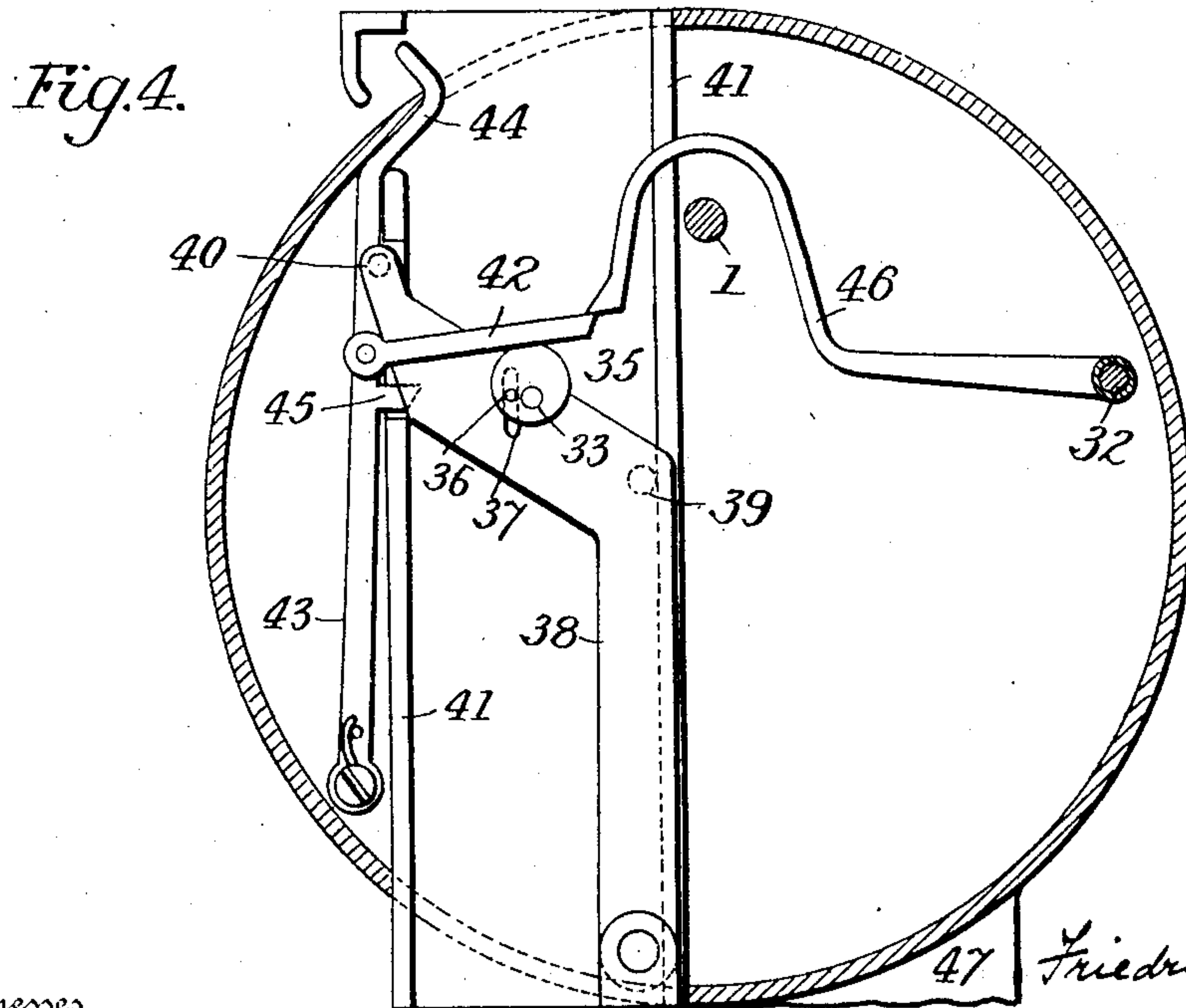
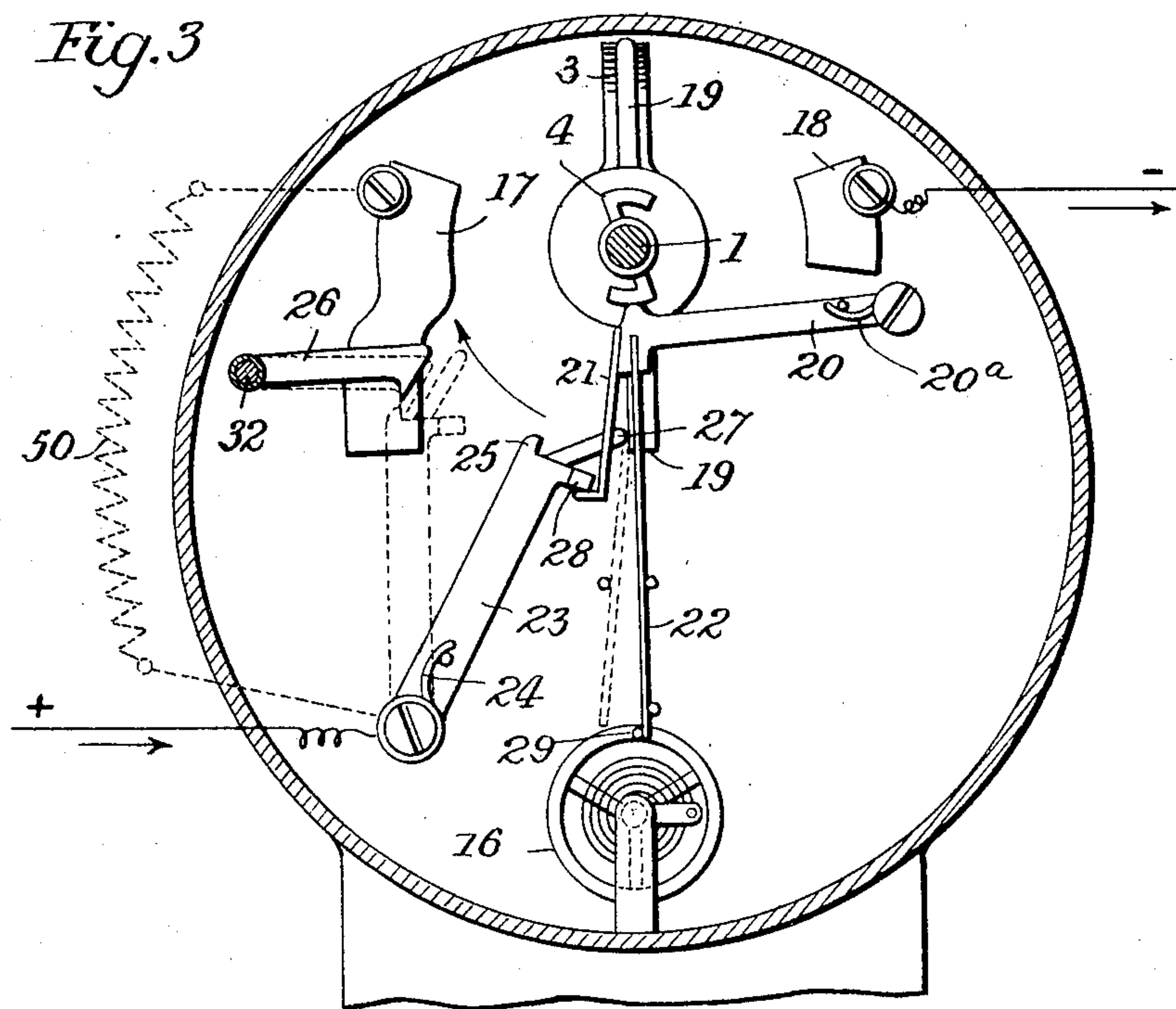
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3 SHEETS—SHEET 2.



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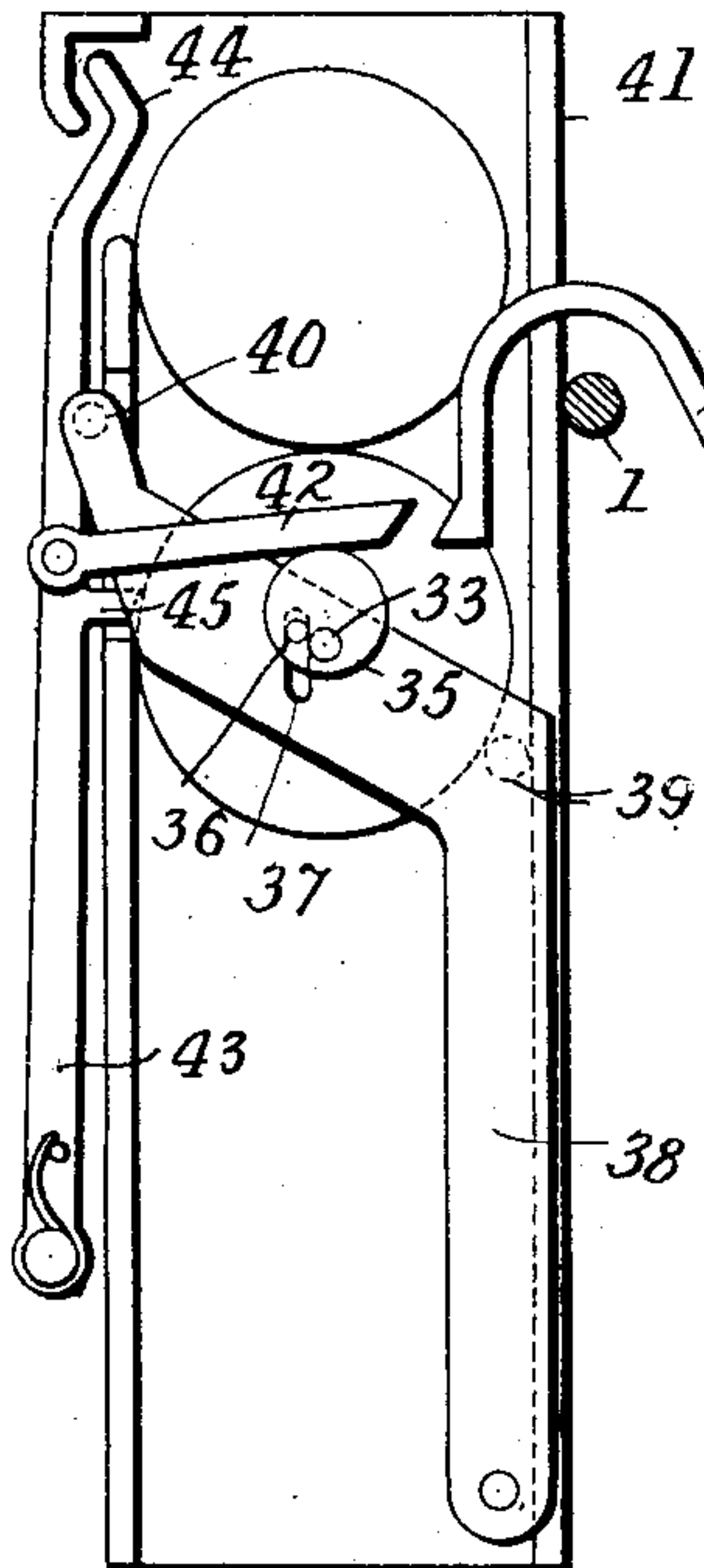
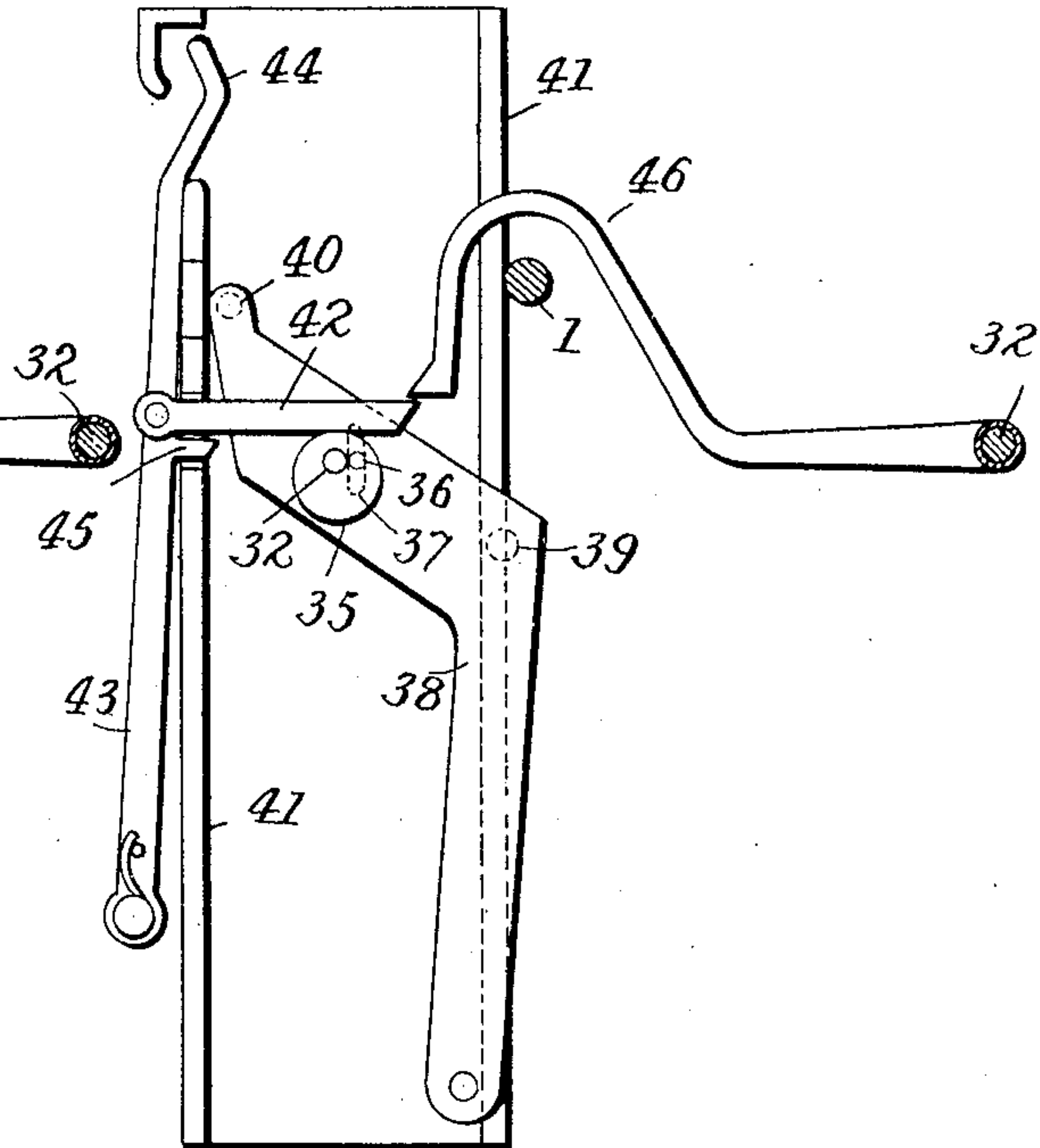
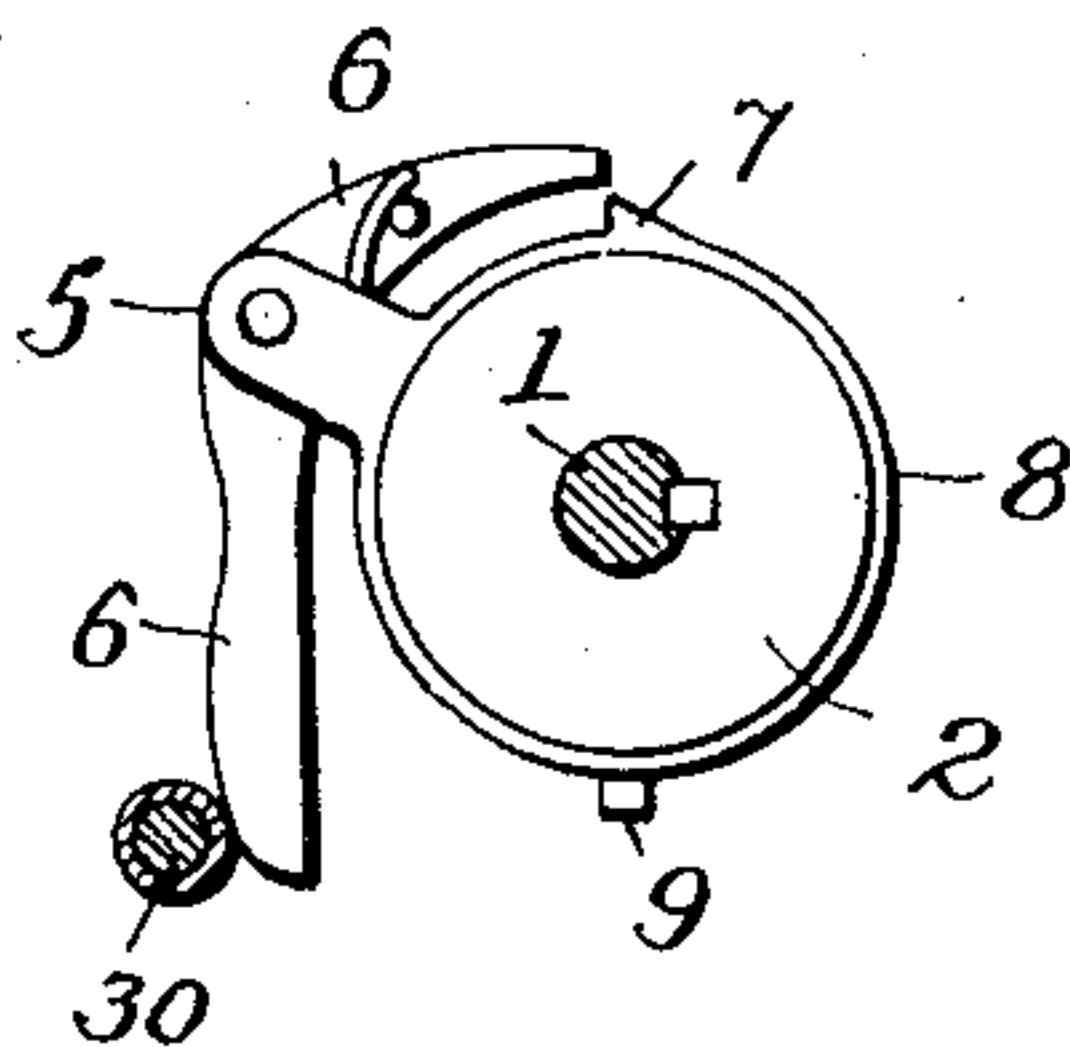
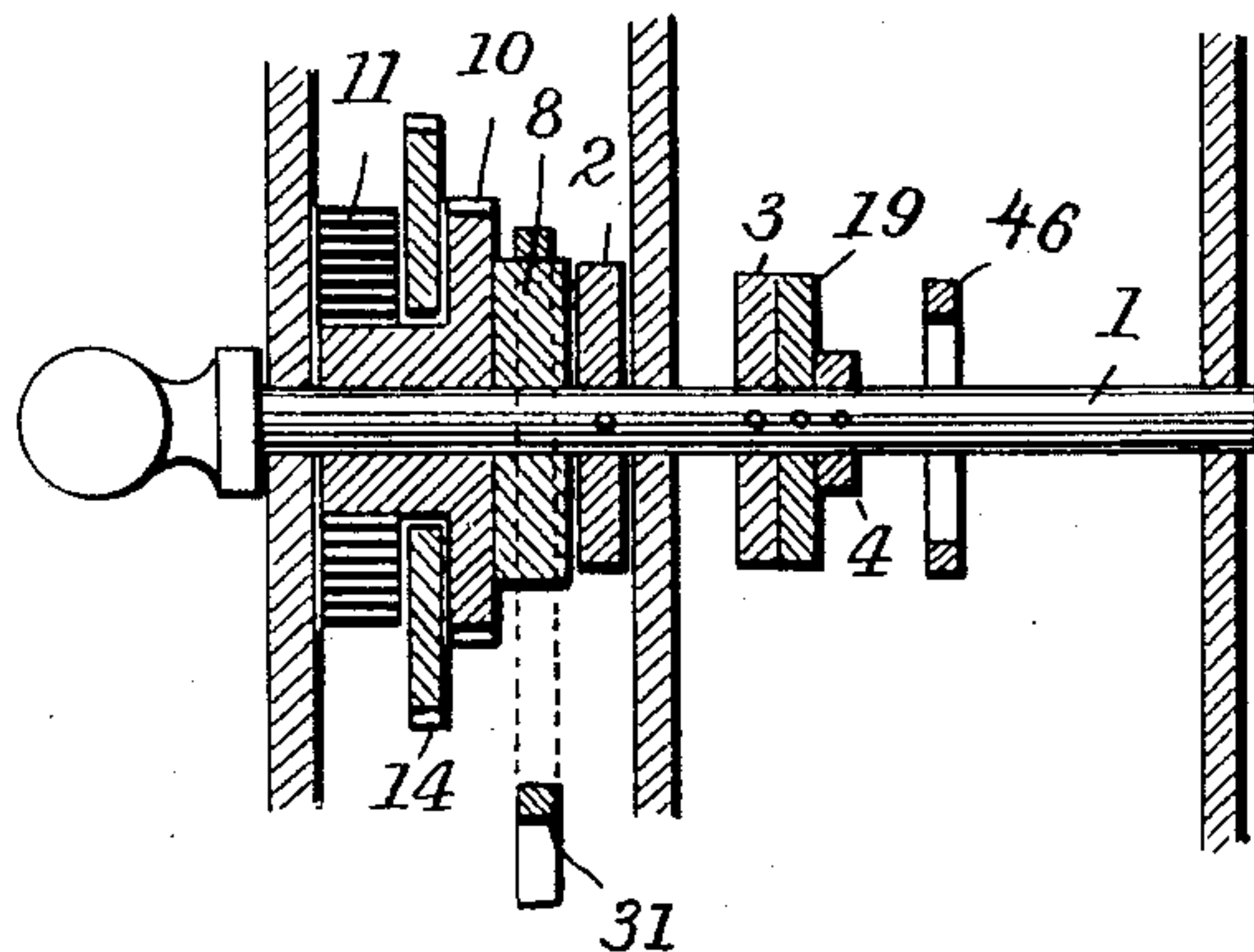
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3 SHEETS—SHEET 3.

*Fig. 5.**Fig. 6.**Fig. 7.**Fig. 8.*

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# UNITED STATES PATENT OFFICE.

FRIEDRICH WILHELM SCHNEIDER, OF FRANKFORT-ON-THE-MAIN, GERMANY.

## ELECTRIC TIME-CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 741,723, dated October 20, 1903.

Application filed January 30, 1902. Serial No. 91,938. (No model.)

*To all whom it may concern:*

Be it known that I, FRIEDRICH WILHELM SCHNEIDER, a subject of the Emperor of Germany, and a resident of Falkstrasse 2, Bockenheim, Frankfort-on-the-Main, Germany, have invented certain new and useful Improvements in Time Mechanism for Controlling the Supply of Electricity, of which the following is a specification.

10 This invention relates to an improvement in time mechanism for controlling the supply of electricity.

With some systems hitherto used simple chronometers are used in place of electricity-  
15 meters, which give the product of current multiplied by tension multiplied by time. The quantity of electricity which passes through is therefore not taken into consideration by itself, this being quite practicable if an al-  
20 ways-uniform quantity of electricity is used per unit of time.

The present invention relates to a chronometer which after the insertion of a certain coin and the closing of an electric circuit to  
25 which it is connected will allow current to circulate in the said circuit for a certain period—for instance, one hundred hours. As an uninterrupted flow of current during one hundred hours is as a rule not required, an ar-  
30 rangement is made by which the circuit can be interrupted and closed any desired number of times after the insertion of the coin without any effect on the coin mechanism. In order to reduce the cost of the apparatus,  
35 clockwork having a short period of running is used—for example, clockwork which will run down after, say, eight hours. This represents the longest period during which un-  
40 interrupted current is usually required. The clockwork is wound up at the same time as the current is turned on. The clockwork operates a shaft actuating the coin mechanism in such a manner that in a period of, say, one  
45 hundred hours the said shaft completes one revolution, the said period being that for which current has been purchased by the insertion of the coin. No effect is produced on the coin mechanism by the number of times the clockwork runs down and is wound up  
50 again during the said one hundred hours.

Figure 1 is a side view of the coin-freed apparatus with the casing in section. Fig. 2 is

a section on the line A B of Fig. 1 seen from the right; Fig. 3, a section on the line C D of Fig. 1, also seen from the right; and Fig. 4, a  
55 section on the line C D of Fig. 1 seen from the left and showing the coin-operated mechanism with one wall of the coin-chute removed. Figs. 5 and 6 show the said mechanism in different positions. Fig. 7 shows a de-  
60 tail of the mechanism of Fig. 2 in another position. Fig. 8 is a detail view of shaft 1 and devices thereon.

The shaft 1 is revolvably mounted in the casing of the apparatus and provided at the  
65 front of the latter with a handle 1', preferably so that it can only be turned to the left. Keyed to the shaft 1 are the disk 2, the contact-bridge 3, and the Z-shaped device 4. The disk 2 is provided with an arm 5, carry-  
70 ing a double-armed spring-pressed pawl 6, adapted to engage the tooth 7 of a disk 8, mounted loosely on the shaft 1. The disk 8 has also a projection 9 and is rigidly con-  
75 nected with the ratchet-wheel 10 and the interior drum of the spring 11, said drum not being shown in the drawings. One end of the said spring is fastened in the known manner to the said drum and the other end to a rod  
80 12, fixed to the casing. The teeth of the ratchet-wheel 10 are engaged by the spring-pressed pawl 13, attached to the toothed wheel 14. The latter drives the pinion 15,  
85 actuating the balance-wheel 16, by means of a train of gear, Fig. 2, and a pin 29 on the side of the said balance-wheel actuates the balance.

The contact-bridge 3 works together with the two fixed contacts 17 and 18 and, accord-  
90 ing to its position, closes or breaks the circuit in the known manner. To each side of this bridge a rod 19 is rigidly fastened. The Z-shaped device 4 coöperates with a spring-pressed pivoted arm 20, the free end of which carries a hook 21 and a rod 22.

95 On the contact 17 an auxiliary switch-lever 23 slides, which a spring 24 tends to push over to the right, Fig. 3—that is to say, to put out of contact. At the free end of the said switch-lever 23 a projection 25, an arm 27,  
100 and an abutment 28 are provided, of which the projection 25 is adapted to engage a pivoted hook 26. The arm 27 is adapted to lie in the path of the rods 19, and the abutment



28 is adapted to abut against the hook 21 of the arm 20.

The action of the switch mechanism and clockwork is as follows: When the switch is closed—that is to say, moved from the cut-off position of Fig. 3 in the direction of the arrow—one of the rods 19 abuts against the arm 27, and thus moves the auxiliary switch-lever 23 into its closed position, in which it is held by the hook 26. The bridge 3 then assumes the position in which it connects the contacts 17 and 18. Current can then enter the circuit, as will be seen from Fig. 3. As soon as the abutment 28 has released the hook 21 the arm 20, and with it the rod 22, moves upward by means of the spring 20<sup>a</sup>. The latter had previously lain against the pin 29 of the balance 16, and thus locked the said balance. During the circuit-closing movement of the switch the pawl 6, engaging the tooth 7 of the disk 8, Figs. 2 and 7, is also moved in the direction of the arrow and rotates the said disk 8. The clockwork is thus wound up. As soon as the free end of the pawl abuts against the roller 30, which is attached to the casing, Fig. 7, the pawl ceases to engage the tooth 7. This takes place when the handle 1' has been turned through ninety degrees. The switch can then be moved on—that is to say, opened again—without influencing the clockwork. When the clockwork has been wound up in the manner described, it begins to run, the balance having been released. Each time the current is switched off the Z-shaped device 4 moves, so as to operate upon the lever 20, and the balance 16 thus stopped. This stopping always takes place when the balance is near one of the extreme points of its oscillation, the pin 29 being properly located on the balance-wheel to be engaged by the rod 22 when the wheel is near one extreme of its oscillation. When, therefore, the balance is released, the clockwork begins to run again without being started from outside. In order that the clockwork cannot ever run down entirely, so that it would not start again by itself, an arrangement is made which causes it to stop automatically shortly before it is entirely run down. For this purpose the projection 9 of the disk 8 is provided, against which projection the curved arm 31, Fig. 2, bears. The latter is keyed, together with the hook 26, Fig. 3, on the shaft 32. Shortly before the clockwork is entirely run down the projection lifts the arm 31, and thereby the hook 26, so that the auxiliary switch-lever 23 moves against the hook 21, thus moving the lever 20, so that the rod 22 is brought into engagement with the pin 29 and stops the balance. When the clockwork, now nearly run down, is wound up again, it will again start automatically.

The shaft 33 of the wheel 34, which latter gears with the toothed wheel 14, extends toward the rear of the apparatus and there carries a cam-disk 35, Figs. 4 to 6. The latter is provided with a pin 36, which engages a

slot 37 in the oscillating locking-lever 38. Two pins 39 and 40 on the locking-lever enter the coin-chute formed by the walls 41. On the cam-disk 35 bears the arm 42, which is pivoted to the spring-pressed lever 43. The hooked free end 44 and the projection 45 of the latter extend into the coin-chute. The arm 42 coöperates with hook 46, which is keyed to the same shaft 32 as the arm 31 and the hook 26.

The coin action is as follows: After the locking of the clockwork and before the insertion of a coin the mechanism is in the position shown in Fig. 4. When thereupon a coin is inserted into the coin-chute from above, the hook 44 of the lever 43 is pushed aside, and therefore also the arm 42. The latter thus releases the hook 46, which moves downward into the position shown in Fig. 5. The coin inserted cannot pass through the coin-chute, being detained by the pin 39. When after the insertion of the coin the circuit is closed, the auxiliary switch-lever 23 remains in its closed position, being held by the hook 26. The hook 26, being mounted on shaft 32, can, however, only descend into this position in which it reaches behind the projection 25 when the arm 42, which is also mounted on shaft 32, has been moved from underneath the hook 46 by the insertion of a coin. It is thus obvious that although the contacts 17 and 18 can be connected from outside by means of the handle 1 current will only flow when the auxiliary switch-lever 23 has been closed—that is to say, when a coin has been inserted into the coin-chute. The speed of rotation of the shaft 33 is such that during the period for which current has been purchased by the insertion of a coin—say one hundred hours—the said shaft will make exactly one revolution. When the end of this period approaches, the arm 42 is again lifted by the cam-disk 35 and causes the hook 46 to be moved upward, so that the circuit is broken and the clockwork stopped in the manner already described.

It is obviously desirable to be able to pay in advance not only for one hundred hours, but for double that period. This is made possible in the following manner: When the inserted coin is released by the oscillation of the locking-lever and has fallen onto the pin 39, which has then entered the coin-chute, Fig. 5, another coin can be inserted. The second coin inserted will first rest against the first coin and when the latter has fallen into the cash-box will descend onto the pin 39, and so on. The lever 43, and thereby the arm 42, is thus held back, so that in moving upward the latter slides past the hook 46, and thus prevents the opening of the switch 23 as long as desired.

The action of the various mechanisms having been described in detail, there remains only to describe that of the whole apparatus. Assuming that the clockwork has run down and the quantity of electricity corresponding



to the coin last introduced has already been used, in order to obtain further electricity one must introduce a coin in the coin-chute and close the circuit, at the same time winding up the clockwork. The circuit can then be closed and opened as often as desired. On the separate periods of supply of current together reaching the quantity of, say, one hundred hours, which corresponds to the value of the coin or, in other words, to the full time of revolution of the shaft 33, the current is interrupted, provided another coin has not been previously inserted.

As shown in Fig. 3, a resistance 50 can be connected in parallel to the switch-lever 23 and contact 17. After opening the said switch-lever 23 the current is not wholly interrupted, but only one resistance is placed in the working circuit, so that the lamps burn less brightly. The user will consequently see from this warning that a new coin must be inserted.

Compared with similar arrangements the improved device presents the advantage of great cheapness, since in the present case a clockwork requiring little time for running down is sufficient. The said clockwork may be wound up as often as desired during the time electricity is required. The repeated winding up is, however, not regarded as a disadvantage, since it is done at the same time as the closing of the circuit.

The coin action hereinbefore described may be used independently of any particular clockwork.

What I claim is, in electric-current-controlling apparatus—

1. The combination with a clockwork, means for stopping and winding the same, a switch in the electric-current circuit adapted to be moved with said winding means and to make contact on the completion of each winding action, means for arresting said clockwork set free on completion of each winding action and adapted to operate to stop the clockwork when said switch is open, another switch in said circuit adapted if open, to be

closed by the winding action, means for retaining it in closed position, and a device time-operated by said clockwork for releasing said last-mentioned switch on completion of a predetermined time run of said clockwork.

2. The combination with a clockwork, means for stopping and winding the same, a switch in the electric-current circuit adapted to be moved with said winding means and to make contact on the completion of each winding action, means for arresting said clockwork set free on completion of each winding action and adapted to operate to stop the clockwork when said switch is open, another switch in said circuit adapted if open, to be closed by the winding action, means for retaining it in closed position, and a device time-operated by said clockwork for releasing said last-mentioned switch on completion of a predetermined time run of said clockwork, together with means for setting the apparatus into operation.

3. The combination with a clockwork, means for stopping and winding the same, a switch in the electric-current circuit adapted to be moved with said winding means and to make contact on the completion of each winding action, means for arresting said clockwork set free on completion of each winding action and adapted to operate to stop the clockwork when said switch is open, another switch in said circuit adapted if open, to be closed by the winding action, means for retaining it in closed position, and a device time-operated by said clockwork for releasing said last-mentioned switch on completion of a predetermined time run of said clockwork, together with means for arresting the balance of the clockwork when almost run down substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRIEDRICH WILHELM SCHNEIDER.

Witnesses:

FRANZ HASSLACHER,  
MICHAEL VOLK.