

No. 622,795.

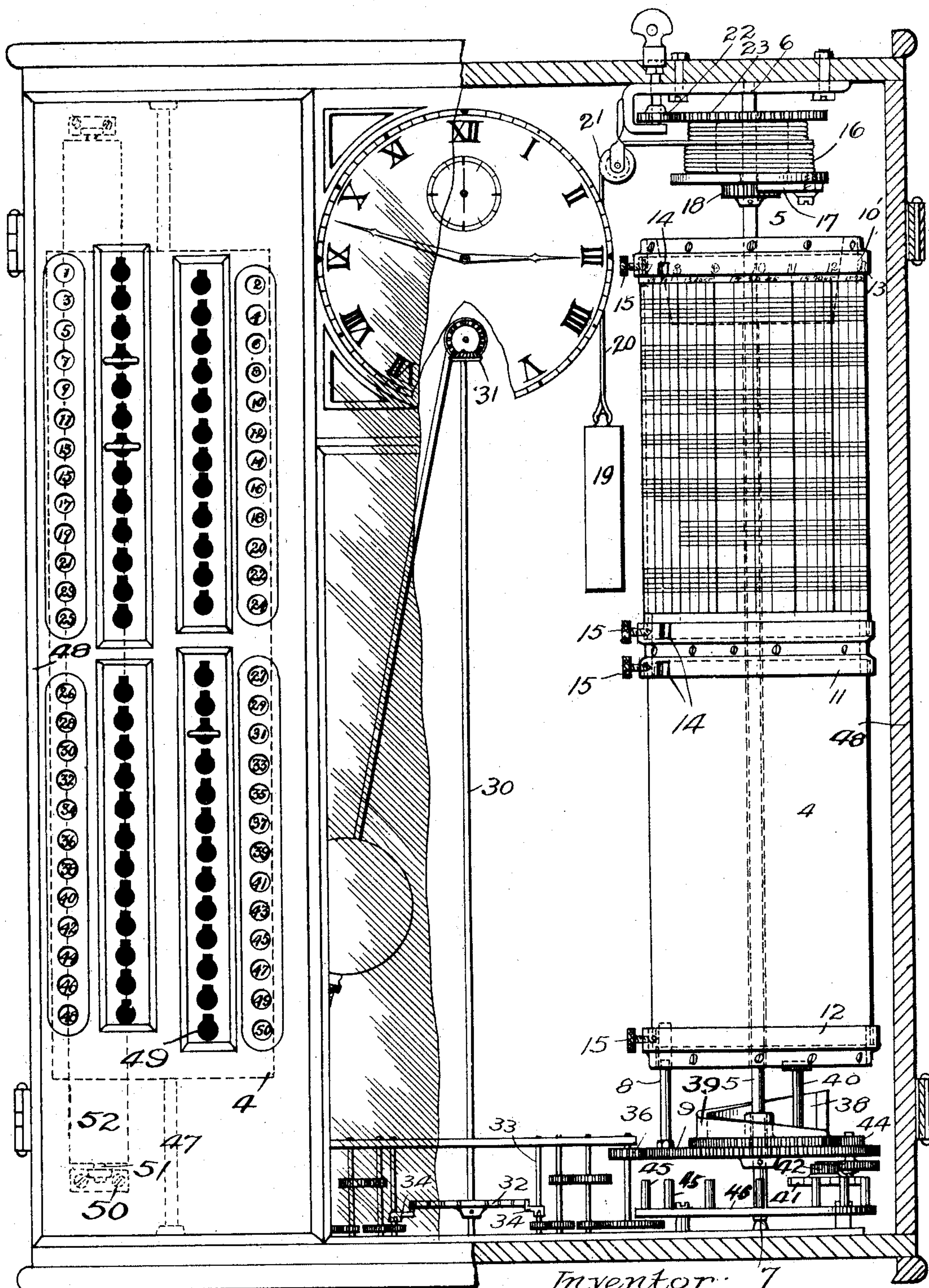
Patented Apr. 11, 1899.

S. A. DEAN.
TIME RECORDER.

(Application filed Oct. 11, 1897.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses:
O. E. Van Dorn
A. F. Holmes

Fig. 1.

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4 Sheets—Sheet 2.

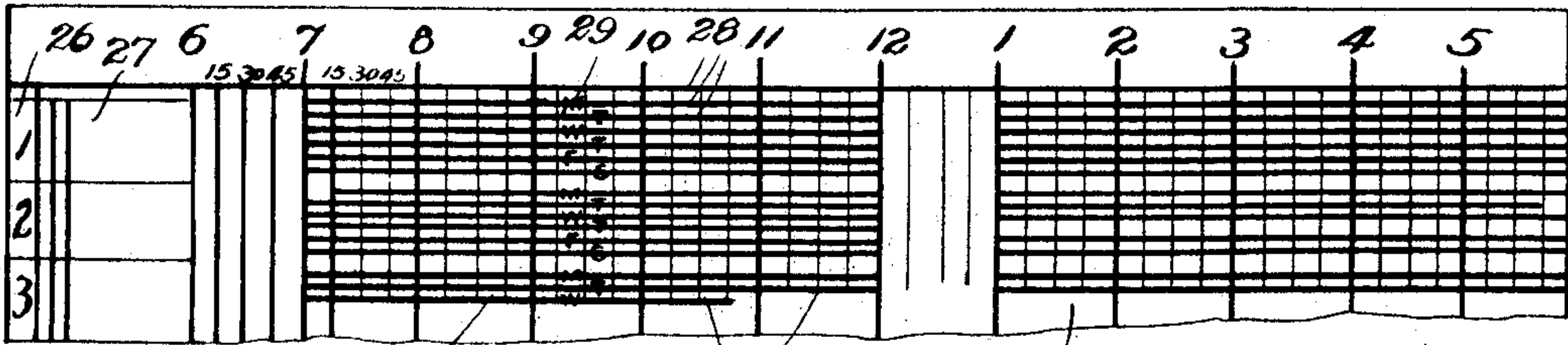


Fig. 2.

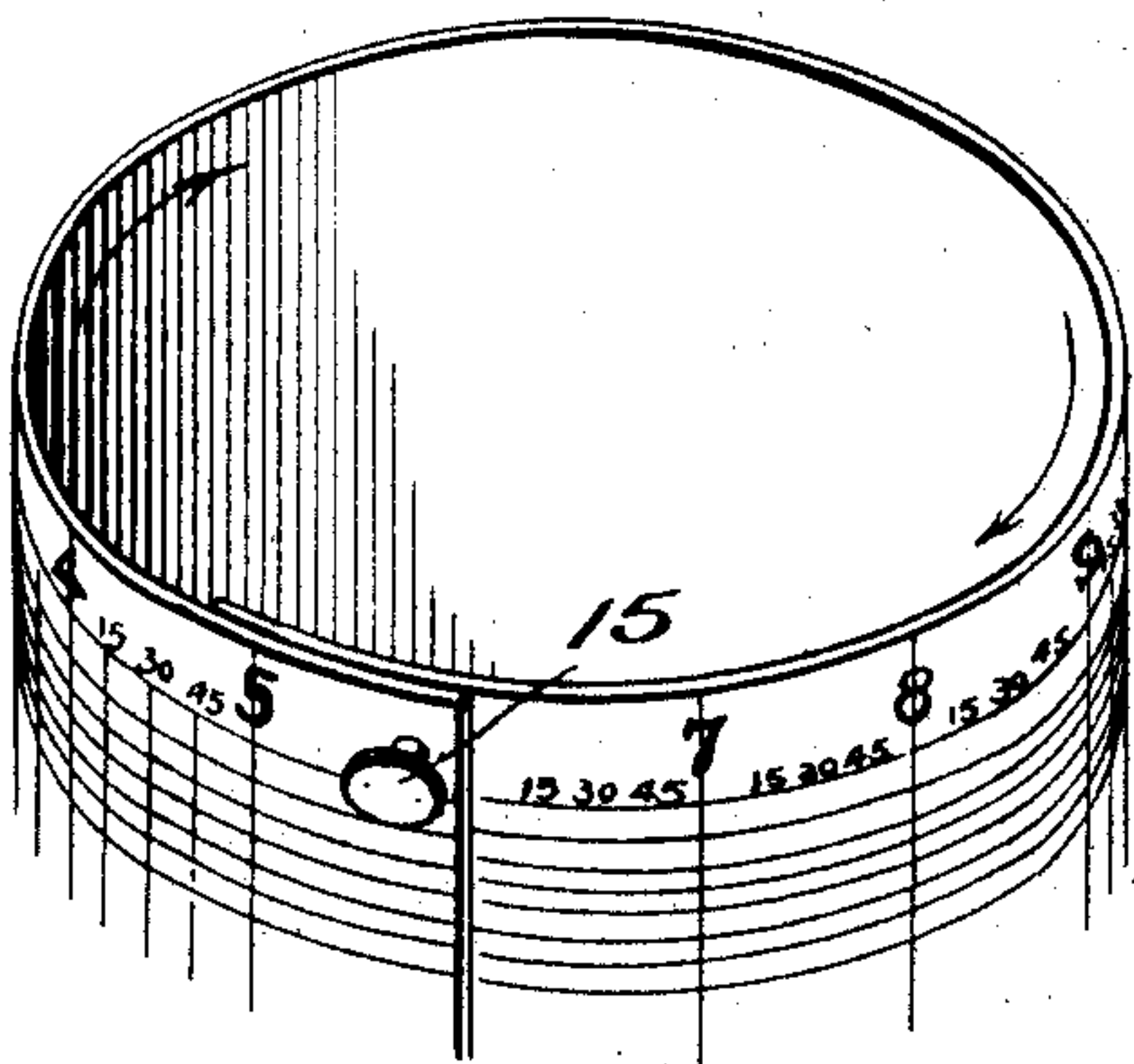


Fig. 3.

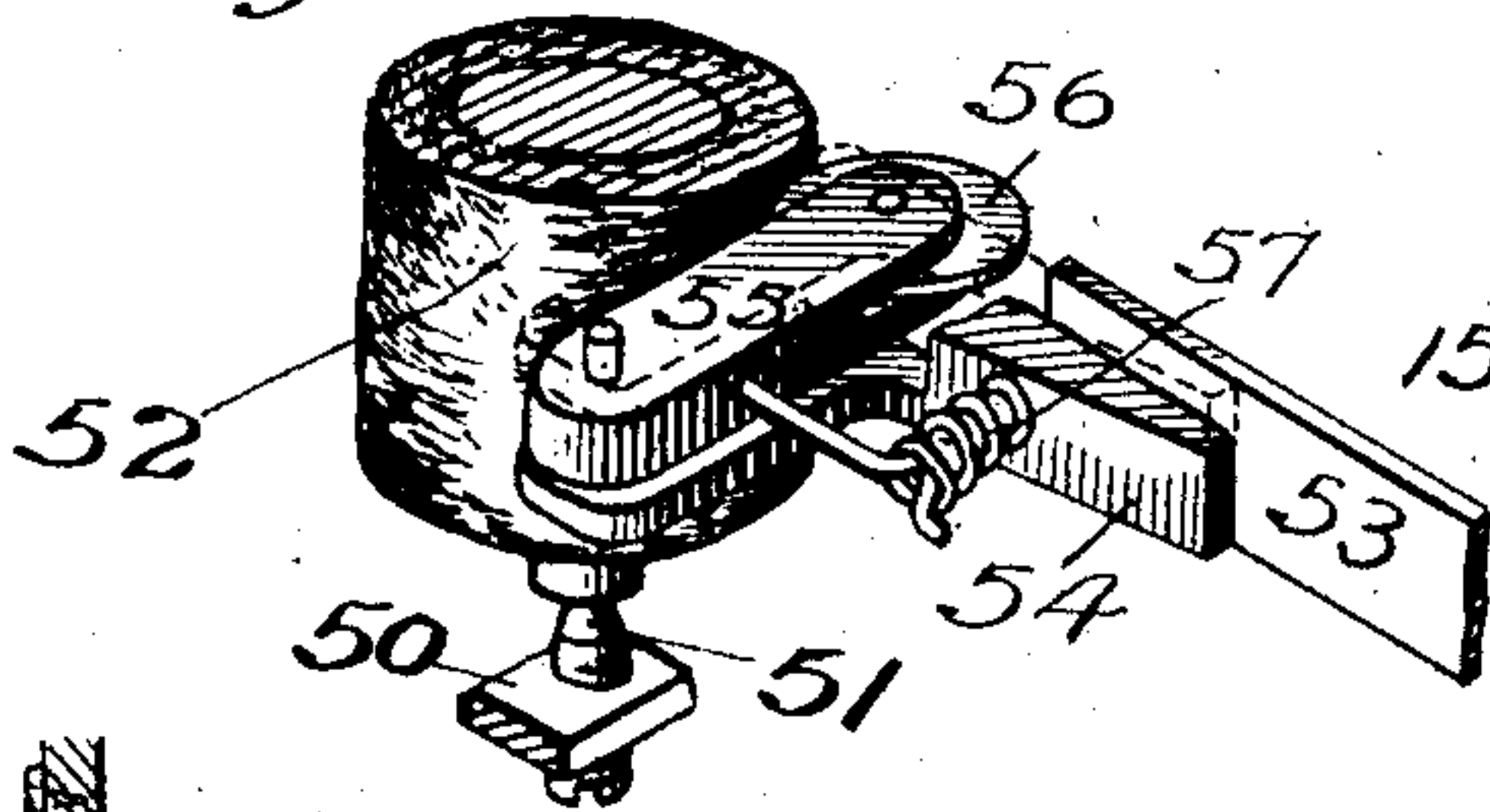


Fig. 4.

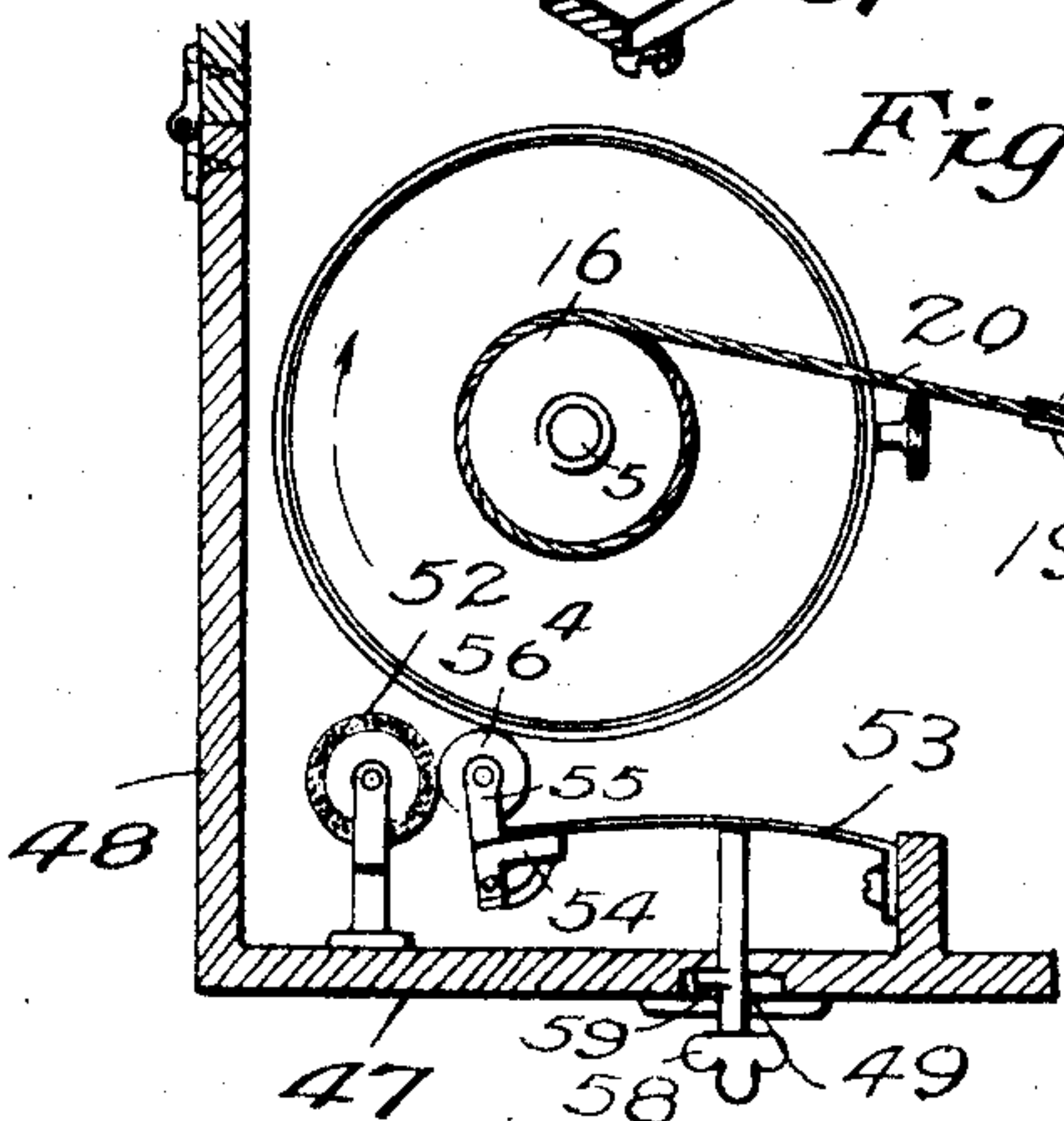
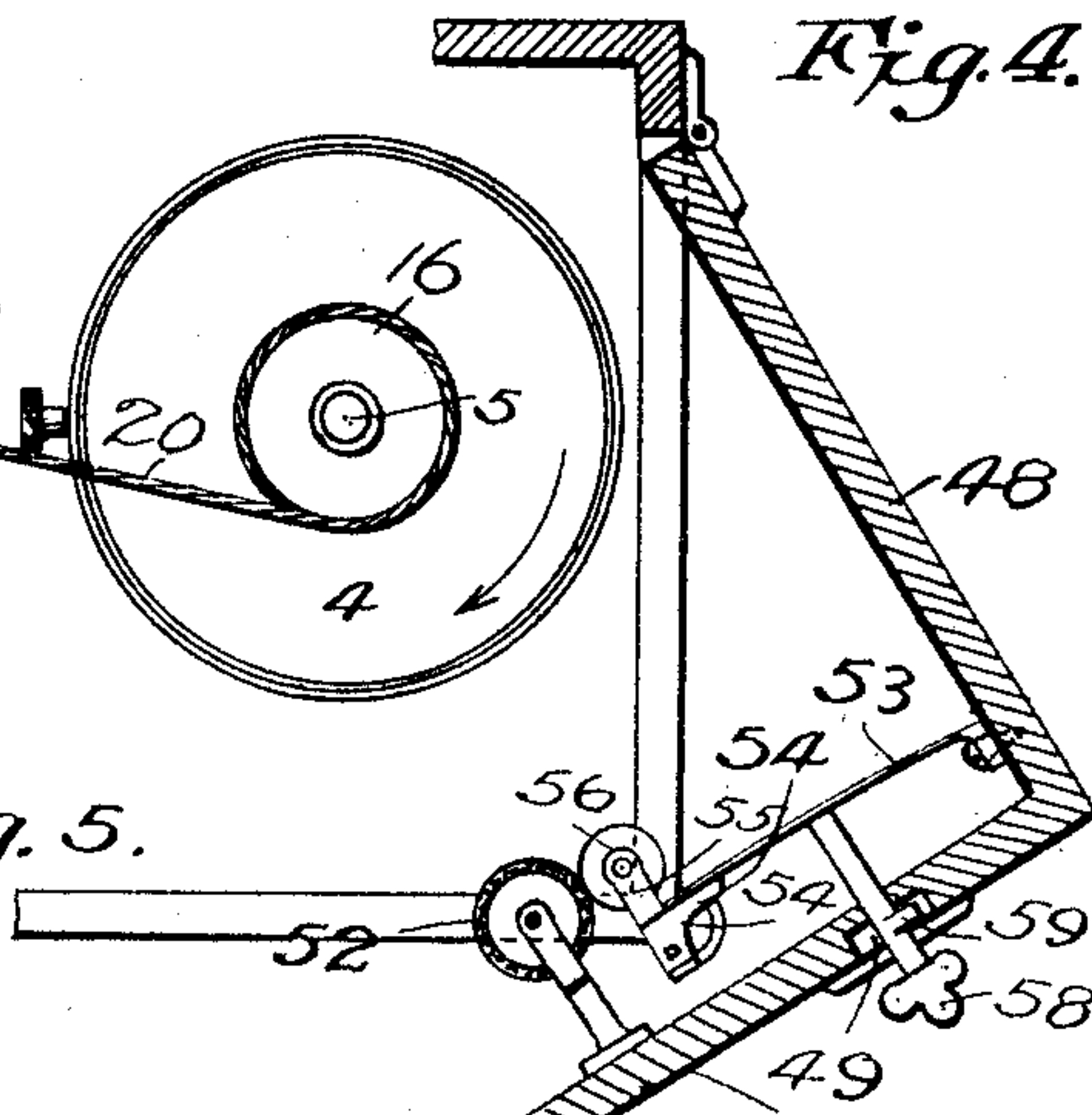


Fig. 5.



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4 Sheets—Sheet 3.

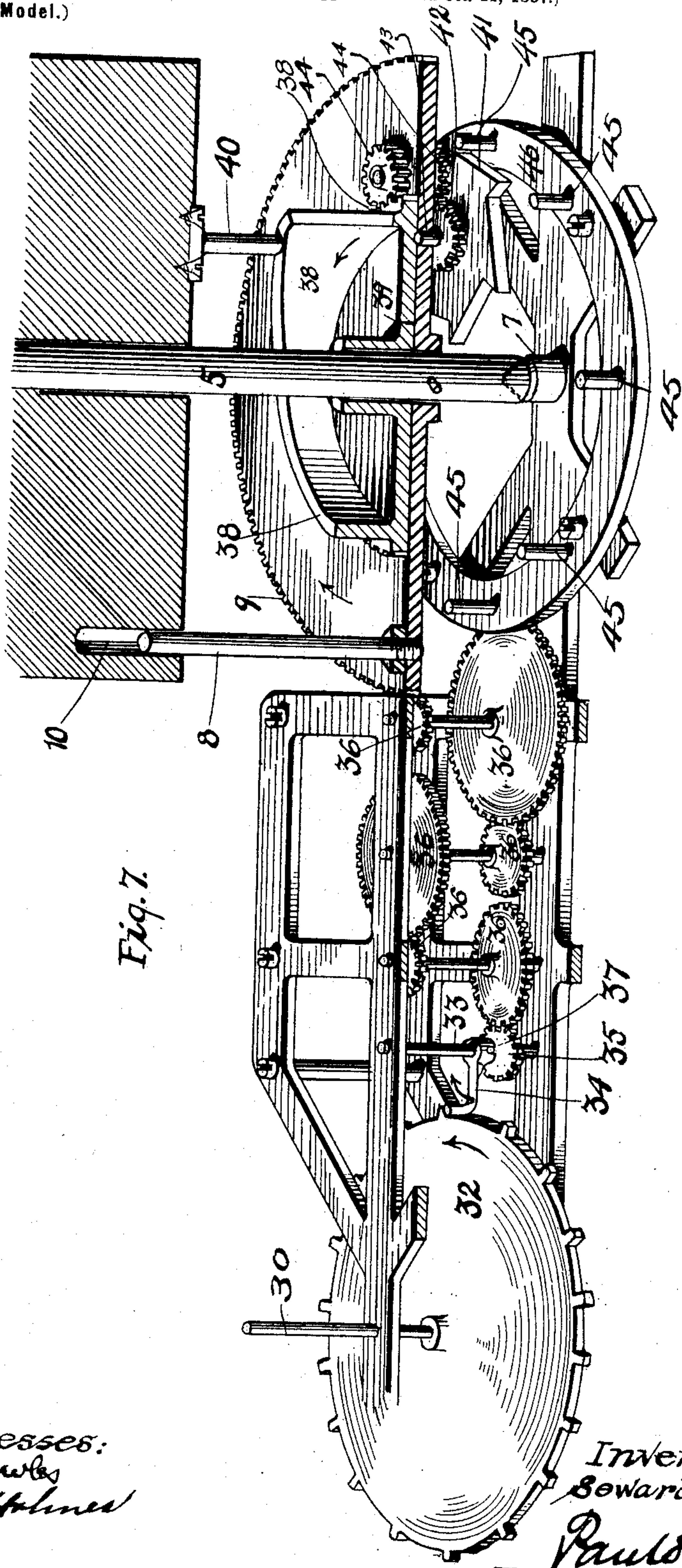


Fig. 7.

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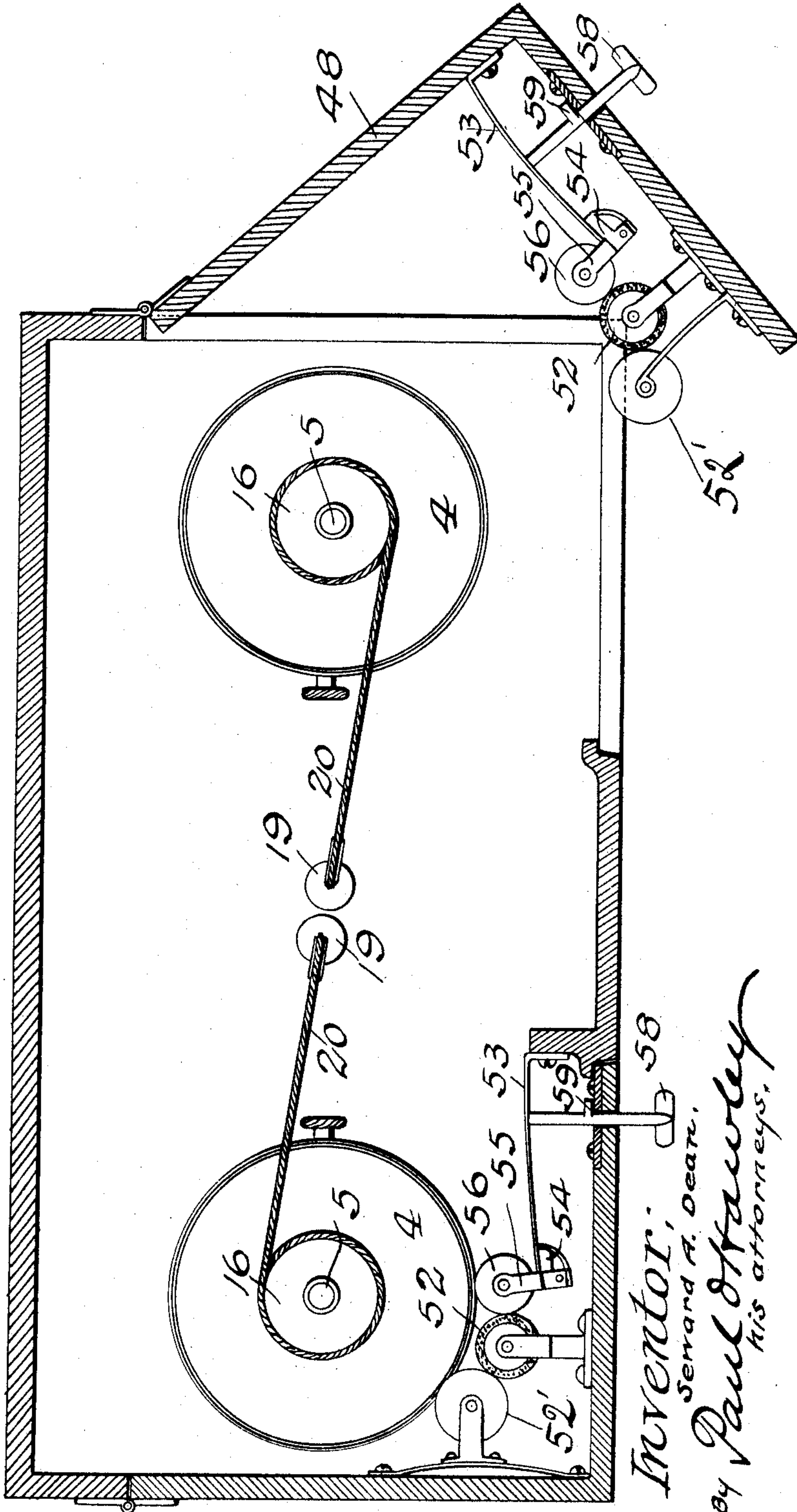
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(Application filed Oct. 11, 1897.)

(No Model.)

4 Sheets—Sheet 4.

Fig. 8.



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UNITED STATES PATENT OFFICE.

SEWARD A. DEAN, OF MINNEAPOLIS, MINNESOTA.

TIME-RECORDER.

SPECIFICATION forming part of Letters Patent No. 622,795, dated April 11, 1899.

Application filed October 11, 1897. Serial No. 654,765. (No model.)

To all whom it may concern:

Be it known that I, SEWARD A. DEAN, of the city of Minneapolis, county of Hennepin, State of Minnesota, have invented certain new and useful Improvements in Time-Recorders, of which the following is a specification.

My invention relates to workmen's and watchmen's time recorders or clocks, by means of which a record may be made and kept showing the time when each man enters the shop or building and also the time when he departs.

The object of the invention is to provide a workman's time-recorder of the simplest possible construction and which will be absolutely accurate as to time, which may be set and attended to by a person not an expert in its use, and which will present a record from which the results may be figured within a very few minutes as compared with the hours of labor now expended over the record-sheets of the ordinary workmen's time-recorders in public use.

A further object of the invention is to provide a key-machine as distinguished from an autographic register.

A further object is to provide a register adapted to be placed upon the wall in convenient position for use by the men as they pass the same, so that a large number of men may record their entrance or departure within a very few minutes, it being possible for several to make records at the same time.

My invention consists generally in the combination, in a paper-carrying cylinder, of a motor for revolving said cylinder, a clock-regulated mechanism to regulate the revolution of said cylinder, and means for automatically raising said cylinder, thereby changing the longitudinal position of said cylinder as the same is rotated.

The invention further consists in particular means for making a record upon the sheet carried by said cylinder, and, further, in particular constructions and combinations of parts, all as hereinafter described, and particularly pointed out in the claims.

The invention will be more readily understood by reference to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a front elevation of the time-register embodying my invention, one-half of

the front of the machine being cut away to show the interior record-roll. Fig. 2 is an enlarged view of a portion of the record-sheet. Fig. 3 shows the manner in which the edges of the record-sheet overlap when on the cylinder. Fig. 4 is an enlarged view of a portion of the cylinder, showing the means for securing the record-sheet thereon. Fig. 5 is a horizontal section through both cylinders, the middle part of the case being broken away. Fig. 6 is a perspective detail showing the inker and the inking-roll. Fig. 7 is an enlarged perspective view of the escapement and mechanism connected with the cylinder. Fig. 8 is a horizontal section through both cylinders, showing the inking mechanism and the extra ink-rolls.

As shown in the drawings, my device is preferably made to be hung or secured upon the wall, having the keyholes in its front conveniently positioned to allow the rapid insertion or removal of the keys belonging to the workmen. In the upper part of the case is a clock, the pendulum of which swings in the lower part of the case. A pendulum clock is used as an accurate regulator obtainable at low cost. In each end of the case, on opposite sides of the clock, I provide a tall cylinder 4, adapted to carry one or more record-sheets wrapped thereon. Each cylinder is arranged on a vertical shaft 5, which shaft, as shown in Fig. 1, is held at its upper and lower ends in and upon bearings 6 and 7, respectively, the lower bearing being preferably a cone or point bearing, as shown in Fig. 7, whereby friction is minimized. The cylinder is adapted to rotate freely on this shaft when it is raised out of engagement with the pin 8, provided on the gear or disk 9, which is secured to the shaft nearest the lower end. As shown in Fig. 7, there is a socket 10 in the lower end of the cylinder to receive the upper end of the pin 8, and the cylinder has considerable longitudinal movement upon the pin before becoming disengaged therefrom. This arrangement is made in order that the cylinder may at any time be raised and rotated to inspect the record on any part thereof. I preferably arrange each cylinder to carry two record-sheets in order that the sheets may be of convenient size to handle or be placed in files after they have

been checked. The cylinder 4 is provided with three metal rings 10', 11, and 12, the rings 10' and 12 being alike, but inverted, and each is provided with an annular groove 13 to receive an edge of the record-sheet. The double ring 11 is also provided with such grooves 13 in its upper and lower edges, and the flange of each ring has a vertical notch 14, as shown in the ring 12 in Fig. 1. These notches are the same depth as the grooves 13 and admit the vertical edge of the record-sheet, so that it may be started around the cylinder. As shown in Fig. 3, the vertical edges of the record-sheet are lapped one upon the other, sufficient paper being allowed for this purpose and the under lap being made in the direction of the rotation of the cylinder. The overlapped edges are pressed against the cylinder, and the sheet is then secured on the cylinder by means of the small thumb-screws 15, provided in the ring. These screws prevent movement of the sheets upon the cylinder, and as the screws engage the lapped edges of the sheet said edges are held taut, so that the sheet cannot wrinkle or bulge. A winding-drum 16 is journaled on the upper end of each cylinder-shaft 5 and is connected with the shaft by means of a pawl 17 and ratchet 18 to communicate movement in one direction to the shaft and through the medium of the gear 9 and pin 8 to the cylinder.

19 is a motor-weight, and 20 the weight-cord, which is carried up over a pulley 21 and attached to the winding-drum. The cord is wound on the drum by means of a key, a key-pinion 22 and a gear 23 on the drum meshing with said pinion. The weights and cords belonging to the two cylinders are so arranged that said cylinders will rotate in the same direction, so that record-sheets which may be used upon one may also be used upon the other without alteration. The record-sheet is ruled, lined, and printed ready for use. A section of a record-sheet is shown in Fig. 2. The sheet is divided into a number of vertical columns 24, equal in number to the hours of a working day, and these columns are marked with figures indicating the hours of the morning and afternoon. These figures are arranged at the top of the sheet, as are also the smaller figures "15," "30," and "45," which last are placed at the top of each column above fine lines 25, which divide the column into four spaces, which are each equivalent to fifteen minutes. On either the right or the left hand side of the sheet is a column 26 for the numbers of the workmen and another column 27 to receive the figures of the bookkeeper, which figures will be the hours of labor, the rate per hour, and the total wages. A space of, say, half an inch is devoted to each workman, and this half-inch takes in the lines 28 drawn during the several days by the automatic marker or inker. For convenience the half-inch is divided vertically by letters "29," indicating days of the week. The record-sheet is automatically raised at the end of

each day by a mechanism hereinafter described, so that a new line is made each day on the record-sheet. At the end of the week there will be six lines opposite the number of each workman who has appeared each day, and the length of the lines will indicate the exact number of hours and minutes of his presence in the shop or building. The sheet being lined or scaled renders it easy to ascertain the time and add the number of hours, it being possible to accurately figure and settle a week's record within a very few minutes.

The cylinder 4 makes but one complete revolution in twelve hours, or in a double or a day or night machine one revolution in twenty-four hours. Compared with the strength of a pendulum-clock movement and the force exerted thereby a considerable power is required to rotate the record-cylinder. For the latter reason I employ the falling weight as a motor for the cylinder. The slow rotation of the drum makes it necessary to provide a mechanism at once delicate and extremely accurate in its operation as to time of and distance of movement and whereby the rotation of the drum is controlled by the comparatively delicate and accurate pendulum clock. The slightest opposition of the weight-motor or friction in the cylinder mechanism would materially affect the accuracy and reliability of the clock, while, on the other hand, the clock can be finely regulated to receive a small supplemental power or impulse from the motors of the cylinders. I therefore couple the clock and the cylinder-motors in such a way that the latter will help the clock and at the same time obtain a step-by-step rotation of the cylinders. This escapement or regulating mechanism is well illustrated in Figs. 1 and 7, wherein 30 is a light shaft extending vertically through the center of the case, but not interfering with the pendulum. The upper end of this shaft is connected to a rotating part of the clock-movement by gears 31, and on the lower end of the shaft 30 is a toothed wheel 32. The shaft and wheel are rotated once an hour, and there are thirty teeth on the wheel. 33 is a small pinion-shaft parallel with the shaft 30 and carrying a small flier or arm 34, adapted to engage a tooth upon the wheel 32. The pinion 35 on the shaft 33 is connected with the gear-wheel 9 on the cylinder-shaft through the medium of reducing-gear and pinions 36 36. The flier 34 is therefore rotated by the force of the weight 19, operating through the gear 9, and the arrangement is such that the arm moves in the same direction as the wheel 32, which is propelled by the clock. The arm will follow a tooth upon the wheel until the same passes out of its reach, whereupon the arm will make a complete revolution and engage with the next tooth on the wheel. The period of disengagement between the flier and the toothed wheel is so small a fraction of a second that the movement of the clock is not disturbed by being relieved from the

pressure of the flier. In this manner the cylinder is moved an almost imperceptible distance every two minutes, or oftener, if desired.

In order to permit the cylinder-gear 9 to be turned backwardly or forward to adjust the record-sheet in exact accordance with the actual time and yet not disturb the clock, I connect the flier 34 to the shaft 33 by a clutch, preferably a simple slot and pin 37, so that the flier may be lifted up out of engagement with the wheel 32 and the train of gears may be operated freely.

As before explained, instead of changing the record-sheets each day the sheet is simply shifted, so as to make room for new lines or, rather, series of lines. For this purpose I employ a mechanism automatic in its action and which does not interfere with the continued and steady rotation of the cylinder. This portion of the device is shown in Figs. 1 and 7 and comprises a spiral cam 38, formed on the top of the gear-wheel 39, which gear-wheel may lie on the top of the gear 9 and is journaled on the shaft 5. This cam is engaged by a depending stud or lug 40, provided on the bottom of the cylinder 4, and if the cylinder is held while the cam is rotated the cylinder will be raised thereby. The gear 9 is practically rotated constantly and a quick movement is required to actuate the cam. For this I employ a star or ratchet wheel 41, which, with a gear-pinion 42, is arranged to rotate on a stud 43, depending from the gear 9. The wheel 41 has any desired number of teeth, according to the movement required by the portions of the other gears. It is connected with the cam-gear 39 by two pinions 44, carried by the wheel 9, and one of which meshes with the pinion 42 and the other with the gear 39. The star-wheel 41 is carried by the gear 9 in its rotation, and its teeth successively engage stationary pins or teeth 45, provided on a stationary ring 46. Obviously as the gear 9 travels the pinions and the star-wheel will be rotated step by step to rotate the cam and raise the cylinder step by step. If it is desired to raise the cylinder abruptly at the end of each working day, there need be but one pin and the cam will be pitched according to the movement required. If, on the other hand, it is desired to raise the cylinder gradually, any number of stationary pins may be employed, as shown in Fig. 7.

Each door 47 of the machine-case is made to include the side or end 48 of the case, which is hinged at the rear edge, so that the whole corner of the case may be thrown back, and thus permit easy access to the cylinder. The markers or inkers are in no wise connected with the motive part of the machine, but are simply carried on these doors, one being arranged opposite each keyhole 49 therein to be moved against the record-cylinder by the insertion of the workman's key. At the bottom and top of each door, on the inner side thereof, is a small bracket or block 50, and one or both may be provided with adjustable

point-bearings 51 (see Fig. 6) to hold the ends of the long inking-roll 52, which is parallel with the cylinder and stands close to the same when the door is closed. (See Fig. 5.) Extra ink-rolls 52' may be provided on the door to bear between the cylinder and the inking-rolls when the door is closed, and thereby communicate the motion of the cylinder to the inking-roll. Opposite each keyhole is a flat spring 53, attached to the door and having a block 54 on its free end, which stands close to the inking-roll. This block carries the link 55, pivoted therein, and in the free end of the link is provided a narrow-faced inking wheel or disk 56. The record-cylinder is preferably made of wood, and this varies in size and shape somewhat with the weather. Therefore to compensate for unevenness in the cylinder and to at all times hold the inking-disks against the inking-roll a light spring 57 is arranged between the link 55 and the block 54 to press the wheel against the inking-roll. The normal position of the inker spring or carrier is such that the inker will stand out of engagement with the cylinder 4; but when the key 58, belonging to the workman is inserted, the inker will be pressed against the record-sheet on the cylinder and as it rotates will spread a narrow line of ink thereon. The key has a bit 59, which, being turned in the keyhole 49, locks the key to hold the inker on the cylinder until the key is removed, whereupon the record-line is terminated. The keys are placed in the machine when the workmen enter the shop and are not removed until the workmen leave the shop.

The operation of my invention and the advantages thereof will be thoroughly understood from the foregoing by those skilled in the art and acquainted therewith.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, in a time-recorder, of the cylinder with means holding a record-sheet thereon, recording devices, regulated means for rotating said cylinder, means for shifting the cylinder longitudinally, and moving with the cylinder to operate the shifting means, and comprising a star or ratchet wheel intermittently operated by engagement with the stationary part, substantially as described.

2. The combination, in a time-recorder, of the record-sheet cylinder, with the parallel inking-roll, and a series of inking devices to engage both said inking-roll and the cylinder, substantially as described.

3. The combination, in a time-recorder, of the record-sheet-holding cylinder, with the parallel inking-roll, and a series of inking devices to engage said inking-roll and the cylinder, said inking devices being yieldingly supported, substantially as described.

4. The combination, of the record-cylinder, with the inking-roll, lock-keys, spring mem-

bers operated by said keys, and yielding inking-wheels arranged upon said members to engage said inking-roll and said cylinder, substantially as described.

5 5. The combination, of the clock-case, with the clock and the record-cylinder therein, the movable door of said case, the inking-roll carried on said door, and the inking devices engaging said roll and also carried on said door,
10 to be moved into engagement with the cylinder by keys placed in said door, and removed therefrom when the door is opened, substantially as described.

6. The combination, in a time-recorder, of
15 the record-sheet-holding cylinder, with a series of inking devices, inking means, means constantly holding said inking devices in engagement or connection with said inking means, and means for actuating said inking
20 devices and whereby the same are held in engagement with both said inking means and said cylinder, substantially as described.

7. The combination, with the record-cylinder, of the rings provided thereon, and having the grooves for the edges of the record-sheet described, and said rings also having
25 notches leading into said grooves to admit the edges of the sheet thereto, substantially as described.

30 8. The combination, in a time-recorder, of the record-sheet-holding cylinder, with a motor driving the same, recording devices to operate on said cylinder, a clock, a gear-train connected with said cylinder, an escapement
35 device provided between said train and said clock and comprising the toothed wheel 32 and the flier 34, the latter rotating with said train and being connected therewith by a clutch, whereby the clock and said train may
40 be separated to permit the free adjustment of said cylinder without regard to said clock, substantially as described.

9. The combination, of the cylinder and means for rotating the same, with a shaft

whereon said cylinder is arranged, a gear secured upon said shaft, an escapement mechanism controlling the rotation of said gear, a spiral or cam to rotate about said shaft, and automatic means periodically operated by said gear to shift said cam and thereby shift said
50 cylinder, substantially as described.

10. The combination, of the cylinder, with means for securing a record-sheet thereon, a cylinder-motor, a clock mechanism, and an escapement device interposed between said
55 cylinder and said clock mechanism to regulate the movement of said cylinder by said motor, a spiral or cam actuated by the movement of said cylinder, and an intermittent gear mechanism whereby said cam is rotated
60 with relation to said cylinder periodically, to shift said cylinder, substantially as described.

11. The combination, of the cylinder, with the shaft whereon the same is longitudinally movable, a motor rotating said cylinder,
65 means for regulating the rotation of said cylinder, a spiral or cam revoluble with said means, and an intermittent gear mechanism moving with said cylinder and connected with said cam, and a stationary part or parts engaged by said gear mechanism periodically
70 to shift said spiral, as and for the purpose specified.

12. The combination, with the cylinder 4, of the shaft whereon the same is longitudinally movable, the gear 9 upon said shaft, the
75 pin 8 whereby the same is connected with said cylinder, the spiral mounted on said shaft and whereon said cylinder rests, and the intermittent gear revoluble with said gear 9 to actuate said spiral, substantially as described.
80

In testimony whereof I have hereunto set my hand this 16th day of September, A. D. 1897.

SEWARD A. DEAN.

In presence of—

C. G. HAWLEY,

A. F. HOLMES.