

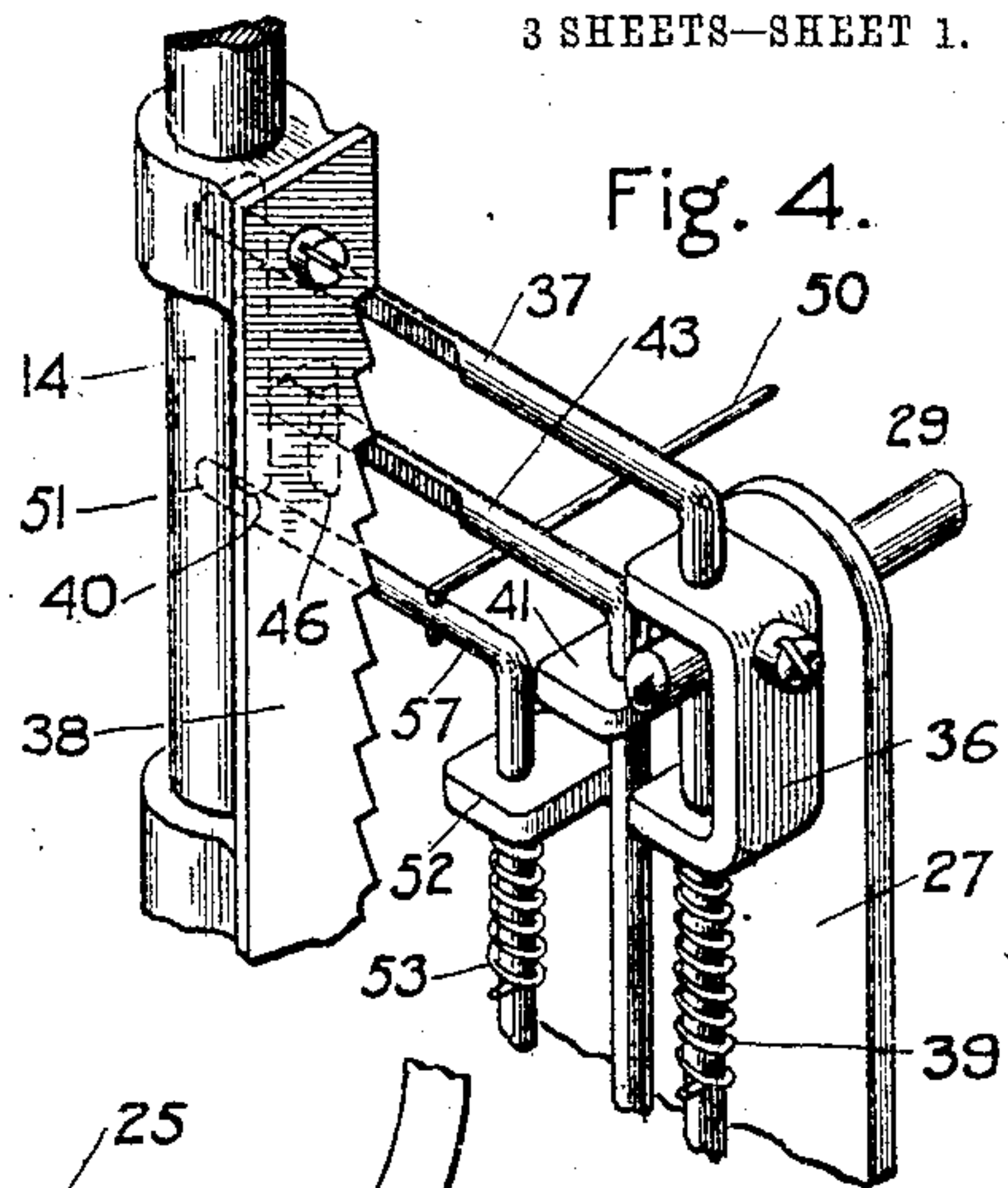
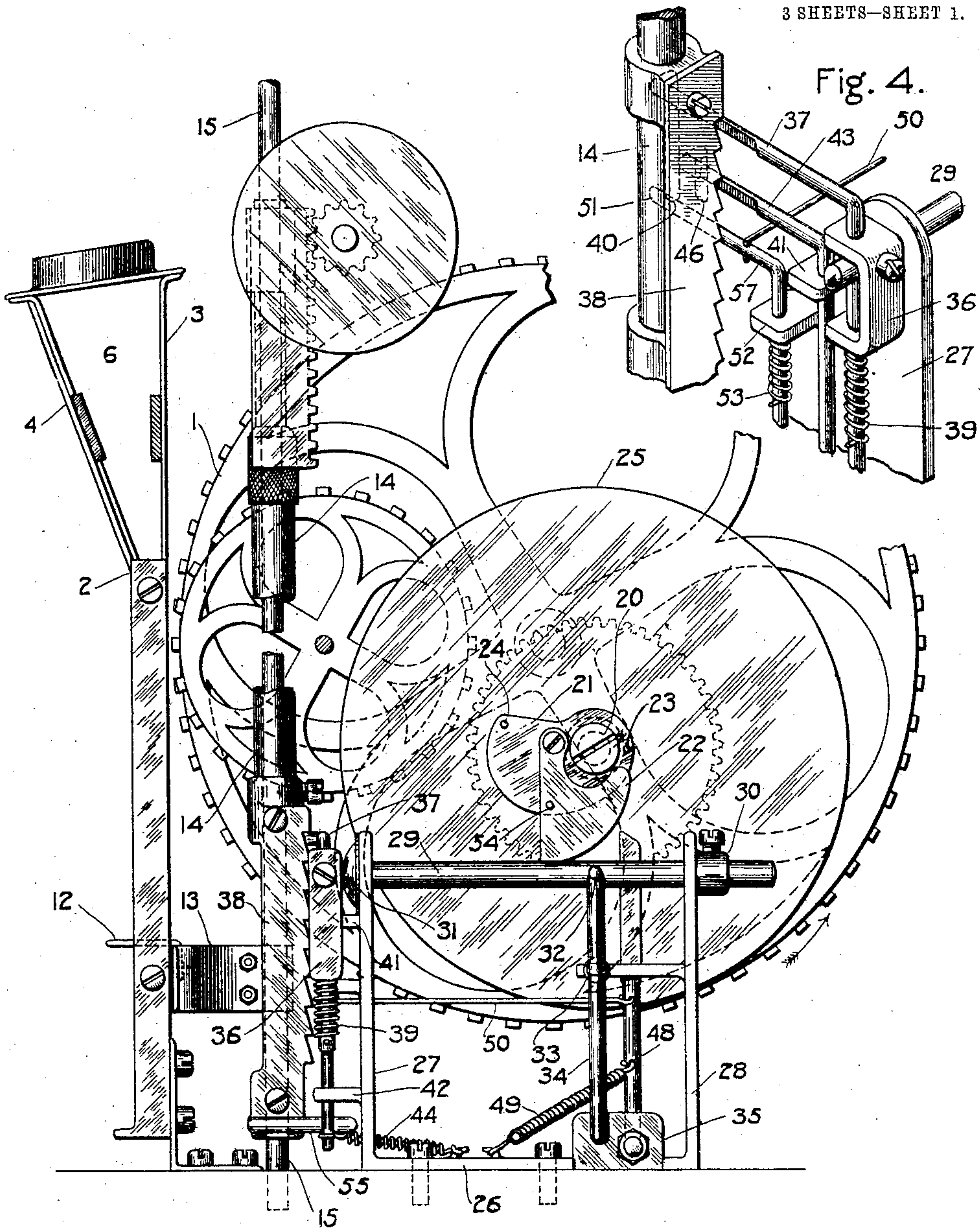
No. 850,526.

PATENTED APR. 16, 1907.

J. & A. DEY.
AUTOMATIC CARD STOP FOR TIME RECORDERS.

APPLICATION FILED MAY 26, 1905.

3 SHEETS—SHEET 1.



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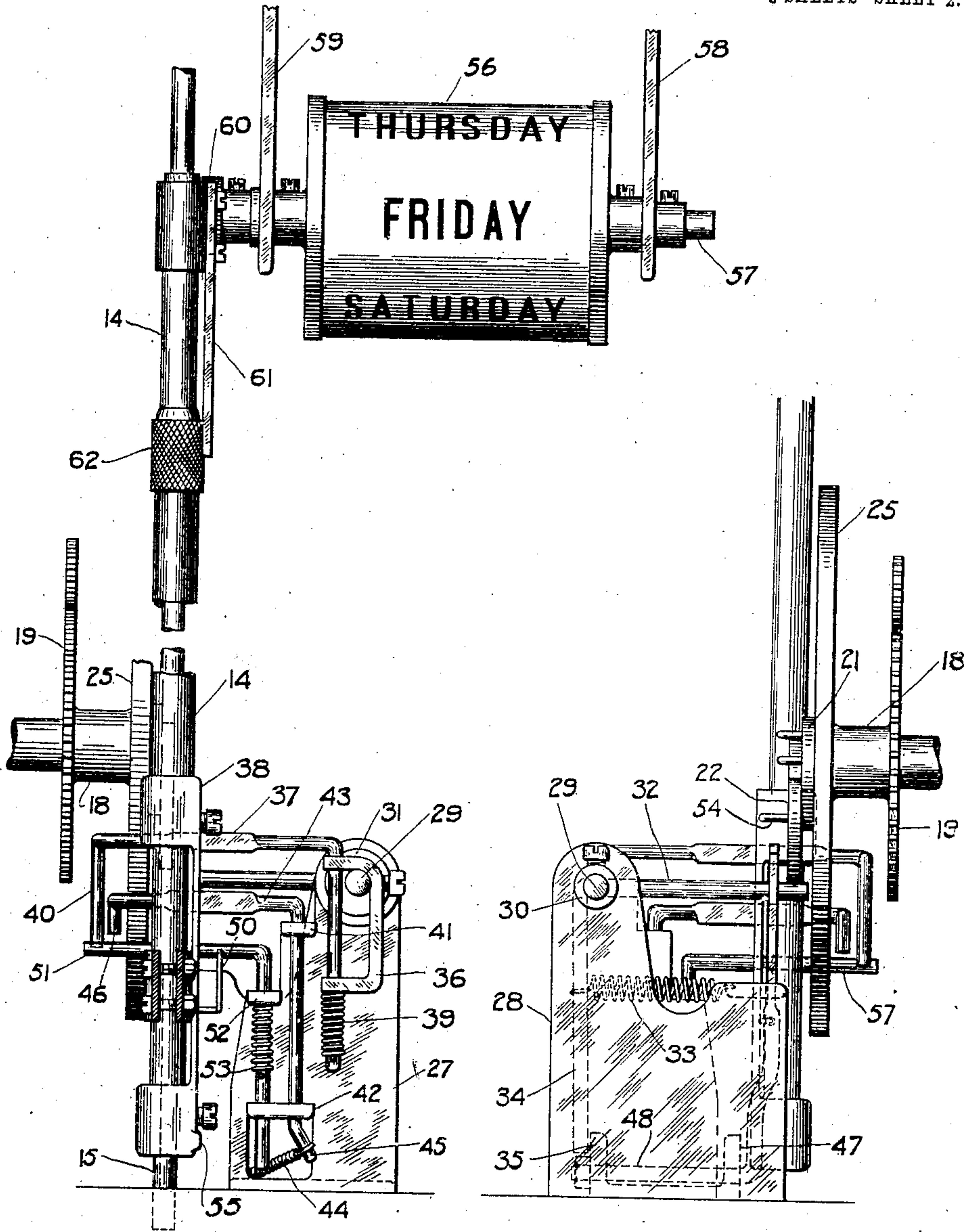


Fig. 2.

Fig. 3.

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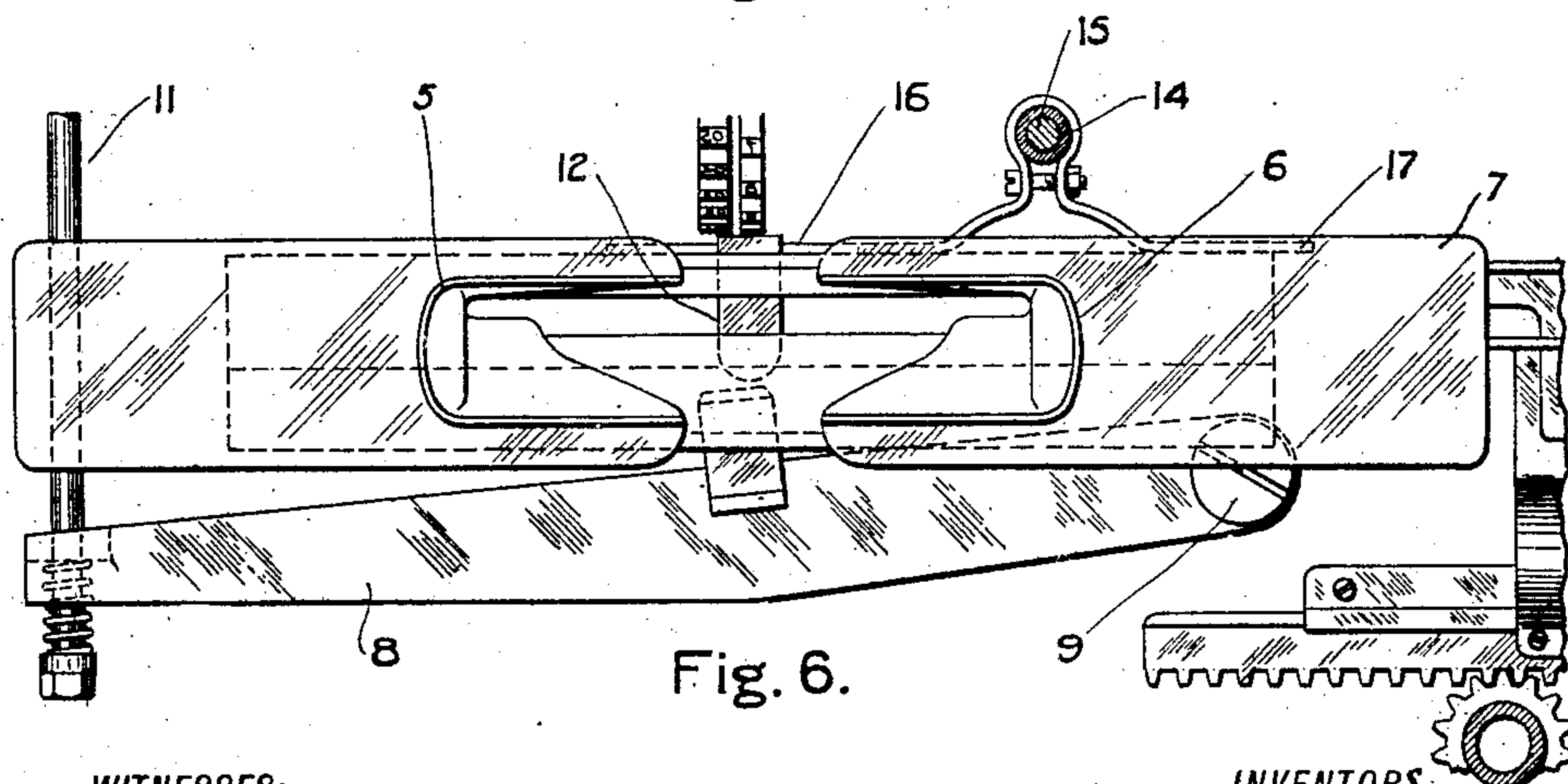
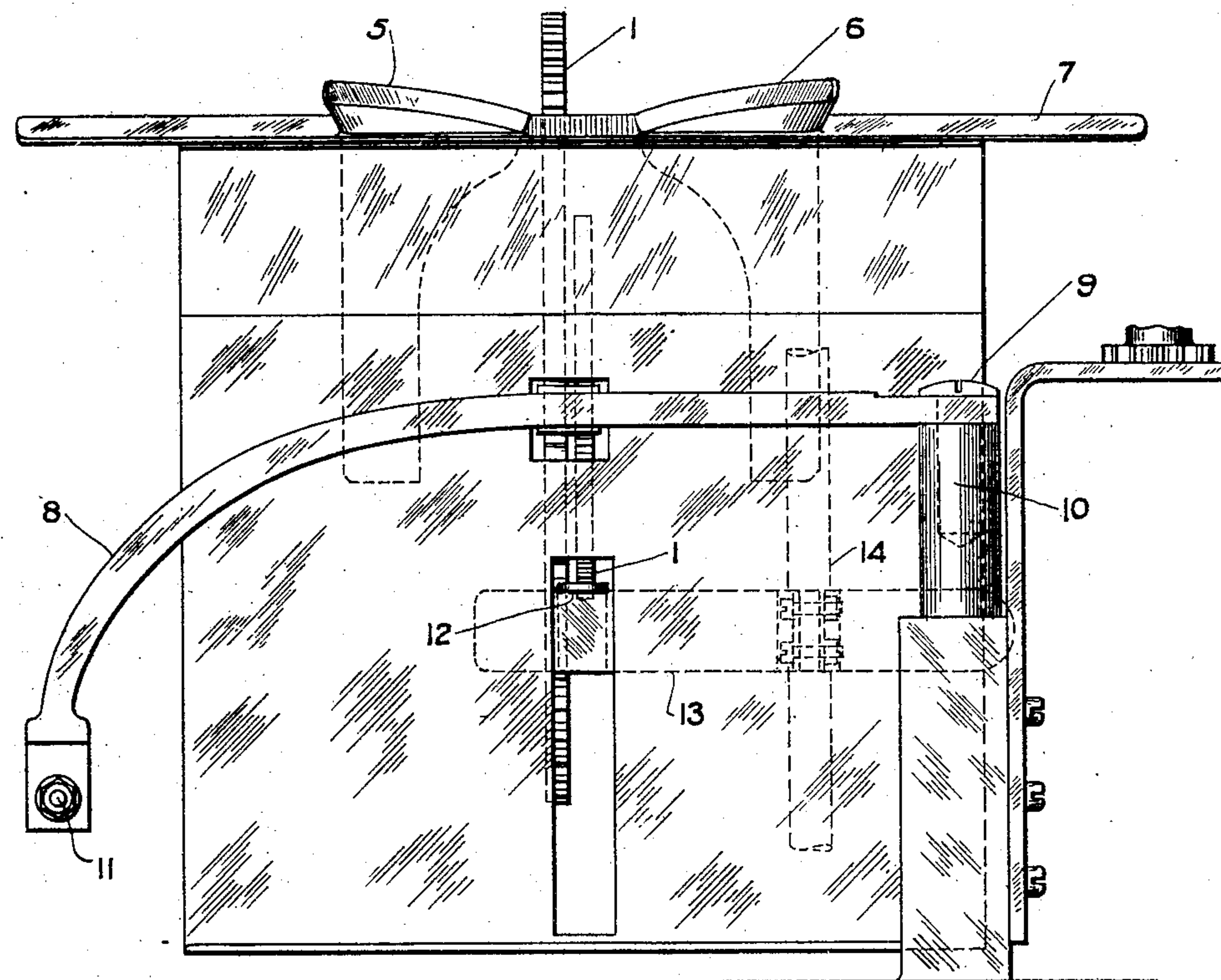
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APPLICATION FILED MAY 28, 1905.

3 SHEETS—SHEET 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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AUTOMATIC CARD-STOP FOR TIME-RECORDERS.

No. 850,526.

Specification of Letters Patent.

Patented April 16, 1907.

Application filed May 26, 1905. Serial No. 262,388.

To all whom it may concern:

Be it known that we, JOHN DEY and ALEX-
ANDER DEY, residing at Syracuse, in the
county of Onondaga and State of New York,
5 have invented certain new and useful Im-
provements in Automatic Card-Stops for
Time-Recorders, of which the following is a
full, clear, and exact description, such as will
enable others skilled in the art to which it ap-
10 pertains to make and use the same.

This invention relates to mechanism for
causing intermittent motion and with regard
to its more specific features to clock-con-
trolled mechanism for use in positioning a
15 record-card in a workman's time-recorder.

One of the objects thereof is to provide
simple and efficient means for intermittently
driving a part from a continuously-moving
member.

20 Another object is to provide practical and
automatically-acting means for intermit-
tently moving a member for a certain prede-
termined number of steps in one direction
and then retracting the same to its original
25 position.

Another object is to provide means of the
above general type in which an abutment or
stop is automatically moved and accurately
positioned and yet the certainty of action of
30 the same not sacrificed.

Other objects will be in part obvious and in
part pointed out hereinafter.

The invention accordingly consists in the
features of construction, combinations of
35 elements, and arrangement of parts which
will be exemplified in the mechanism herein-
after described and the scope of the applica-
tion of which will be indicated in the follow-
ing claims.

40 In the accompanying drawings, wherein is
shown one of various possible embodiments
of our invention, Figure 1 is a side elevation
of the same. Fig. 2 is a front elevation of
certain parts shown in Fig. 1. Fig. 3 is a
45 rear elevation of certain parts appearing in
Fig. 1. Fig. 4 is a detail view showing the
action of ratchet-and-pawl mechanism. Fig.
5 is a front elevation of a card-receiver and
associated parts. Fig. 6 is a plan of the
50 same.

Similar reference characters refer to simi-
lar parts throughout the several views of the
drawings.

As tending to render better understood
certain features of our invention it may here 55
be noted that in a mechanism employing a
toothed member having coacting therewith
actuating and holding pawls respectively
adapted, as indicated by their names, to
move this member and to hold the same in 60
the position in which it is moved if the oper-
ative portions of these pawls be positioned a
sufficient distance apart to insure the entry
of the holding-pawl into operative position
upon the actuating-pawl completing its 65
movement there is for this reason certain
amount of backlash or play which is taken
up as the actuating-pawl is removed from its
engaging position. This action would result
in the placing of the toothed member in 70
either of two positions, according as the ac-
tuating-pawl is in operative relation thereto
or is thrown into an inoperative position,
thus letting the member drop upon the hold-
ing-pawl. If mechanism of this type be used 75
in positioning a record-receiving surface, it
will readily be seen that the slight shifting of
the same due to the above-mentioned play or
backlash will throw the record out of aline-
ment. It may also here be noted that if in 80
connection with the mechanism immediately
above referred to a single step be missed due,
for example, to the failure of the holding-
pawl to reach beneath the tooth which it is to
engage, the entire recorder is thrown out of 85
order and the records confused. It may also
be noted at this point that in the case in
which a member is intermittently actuated
by continuously-driven clockwork a con-
siderable burden is imposed upon the clock- 90
work at the time of driving the intermit-
tently-driven member, necessitating the em-
ployment of powerful driving mechanism un-
less means be provided to render the dis-
tribution of the load thereon more uniform. 95
The above and other defects are remedied in
constructions of the nature of that herein-
after described.

Referring now to Fig. 5 of the drawings,
there are shown, diagrammatically, printing- 100
wheels 1 of any desired form, the same being
preferably driven from clockwork, (not here
shown, as it in itself forms no part of the
present invention.) Opposite the printing-
wheels is a record-card receiver comprising 105
the front and rear plates 2 and 3, the former

of which is flared, as shown at 4, so as to provide an opening of the desired width. Between these plates are positioned card-engaging members 5 and 6, having secured thereto cover-plates 7, adapted to inclose the card-receiver except at the portion between these members. A suitable pressure-lever 8, pivoted, as by the screw 9, upon a post 10, may be actuated in any desired manner, as by the rod 11, flexibly connected therewith, to force a record-receiving member inserted between the members 5 and 6 into engagement with the printing-wheels 1, and thus form a record thereon.

The downward movement of the card or other record-receiving member within the receiver is limited, as by an abutment 12, fixed upon a strap 13, which is clamped about a sleeve 14, slidably mounted upon the vertical guide-rod 15, as shown in Fig. 1 of the drawings. This strap, which is guided, as by the sliding contact of its portions 16 and 17 with the rear plate of the card-receiver, is moved in a vertical direction by means hereinafter described.

In Fig. 3 of the drawings there is shown a sleeve 18, driven in any desired manner, as from clockwork, a portion of which is shown at 19. This sleeve has fixed upon its outer end, as by means of screw 20, a disk or plate 21, having pivotally mounted thereon a cam member 22. The movement of cam 22 relative to plate 21 is limited, as by pins 23 and 24, serving as stops therefor with the cam in position either closely adjacent the sleeve 18 or at the extreme of its movement away from the same. A disk 25 is shown in the illustrative embodiment set forth, which may act as a support for the plate 21 or to perform any other desired function.

Referring to Fig. 1 of the drawings, there is shown a frame 26, having the upwardly-projecting ears 27 and 28, within which is journaled a rock-shaft 29. Longitudinal movement of this rock-shaft within its bearings is prevented, as by an adjustable collar 30 and a disk 31, and there is formed thereon or secured thereto an arm 32, adapted to project within the path of travel of the cam 22 above described. This arm is normally held in its uppermost position by means of a spring 33, one end of which is secured in fixed relation to the ear 28 and the other end of which is connected with an arm 34 upon the rock-shaft 29 and holds the same in engagement with a lug 53, hereinafter described. Upon the end of the rock-shaft adjacent the above-mentioned sleeve 14 is fixed a yoke 36, having journaled therein so as to swing in a substantially horizontal plane a pawl 37, adapted to engage and coact with a rack 38, secured upon the sleeve. This pawl is provided with a spiral spring 39, tending normally to throw the same into engagement with the rack, and the free end thereof is bent down-

wardly, as shown at 40 in Fig. 2 of the drawings, for a purpose hereinafter described.

Journaled upon the lugs 41 and 42, formed upon ear 27, is what may be termed a "holding-pawl" 43 of a form similar to that of the pawl 37 above described and normally maintained in engagement with the rack, as by means of a spring 44, connected with the bent lower end thereof, as at 45. The depending end 46 of pawl 43, however, terminates as a point above the corresponding portion of pawl 37 for a purpose hereinafter described. By the above means as the rock-shaft is oscillated by reason of the successive engagements of the cam 22 with the arm 32, formed thereon, the pawl 37 raises the rack 38 tooth by tooth, the latter member being held in its raised position by the holding-pawl 43. The upper edges of the pawls 37 and 43 are spaced one from another by a distance slightly greater than twice the pitch of the rack 38, or, in other words, than the distance between corresponding portions of alternate teeth of this member. It will thus be seen that as the pawl 37 raises the rack under the influence of spring 33 a slight clearance is provided between the upper edge of the pawl 43 and the face of the tooth beneath which it is to engage, thus permitting the spring 44 readily to swing the holding-pawl into operative relation to the rack. With the above mechanism as the pawl 37 or "actuating-pawl," as the same may be termed, is slowly retracted by the action of the cam 22 the rack 38, and consequently the abutment 12, would be permitted to fall slightly on account of the above-mentioned clearance or play, with a consequent error in the alignment of the records made at this time. Such error is eliminated by the following means.

Recurring to Figs. 1 and 3 of the drawings, there are shown a pair of upwardly-extending lugs 35 and 47, formed upon the member 26 in such manner as to form bearings for a lever-arm 48, the lug 35 also acting as a stop for the arm 34 as above described. Lever-arm 48 is normally drawn toward the rack, as by spring 49, and is connected, as by a link 50, with a trip or releasing arm 51, journaled in lugs 42 and 52, as shown in Fig. 2 of the drawings. This arm, which is normally swung in the direction of the rack, as by a spiral spring 53, is adapted to be rotated in a horizontal plane upon the lever-arm 48 swinging within its bearings. Such motion of the lever-arm is brought about by the engagement therewith of a pin 54 upon the cam 22, the same tending through the above-described connection to rotate the arm 51. Under normal conditions this rotation of the arm 51 causes merely the disengagement of the pawl 37 with the rack 38, the same being swung through the depending tip 40. Upon the rack being raised throughout a certain predetermined distance—as in the present

case throughout a space equal to seven teeth, each tooth preferably corresponding to a day of the week upon the record-surface used—a pin 55, fixed upon the rack, engages the arm 51 and raises the same, compressing the spring 53 so as to spring the arm above the depending end 46 of pawl 43. Upon the same then being swung as above described through the lever 48 not only actuating-pawl 37, but holding-pawl 43 also, will be thrown for a time from engagement with the rack, thus permitting the same to fall to the position from which it was raised.

In order readily to indicate the position of the abutment 12, an indicator 56 is mounted upon a shaft 57, journaled within hangers 58 and 59 and having fixed thereon a pinion 60, intermeshing with a rack 61 upon the sleeve 14. This indicator, which is preferably of a cylindrical form, has printed or otherwise formed upon its outer surface characters indicative of the several positions of the abutment 12, these characters in the illustrative embodiment herewith shown representing the days of the week. In this manner as the rack 38 is raised throughout its successive steps the indicator 56 is rotated throughout corresponding angles and serves to publish by the characters displayed in a predetermined position the position of the abutment.

The operation of the above-described embodiment, which should be largely obvious from the above description, is as follows: Assuming the rack 38 to be in its lowermost position, the cam 22 is swung by the sleeve 18, which preferably undergoes one revolution every twenty-four hours, in such position as to engage the arm 32 and rest in contact with the stop-pin 24. The arm 32 is thus depressed until the same passes the point of greatest eccentricity of the cam, whereupon it is released and snapped upwardly by the spring 33, thus causing the pawl 37 to raise the rack throughout a predetermined distance and the pawl 43 to be in position to hold the same substantially in the position into which it has been raised. Immediately after the release of arm 32, however, the pin 54 engages lever 48 and swings the same so as to draw the pawl 37 from engagement with the rack and permit the same to rest upon the pawl 43, thus insuring the correct alinement of the record, as above described. The rack is thus raised throughout the desired number of steps, and when it has completed its predetermined path of travel the trip-arm 51 is raised as before described, so as to engage not only the depending end 46 of pawl 37, but the corresponding portion 46 of pawl 43, and upon being swung through the lever 48 withdraws both pawls and permits the rack to fall to its initial position. This cycle of operations is then repeated.

The indicator 56 operates in the manner above set forth to show the position of the

abutment 12, and thus indicate within certain limits the portion of the card upon which the record will be printed. If desired, a grip or knurled portion 62 may be provided upon the sleeve 14, so as to permit the same to be adjusted manually.

Owing to the peculiar construction of the cam 22, the clockwork may be moved in the reverse direction from that indicated by the arrow in Fig. 1 of the drawings to any desired extent without affecting either the rock-shaft 29 or the lever-arm 48. This action is due to the fact that upon the sleeve 18 being rotated in a clockwise direction with reference to Fig. 1 of the drawings the cam is lifted toward pin 23 upon engaging arm 32 and passes over without depressing the same, thus carrying pin 54 over lever 48.

It may here be noted that the expression "immediately subsequent" is used throughout the following claims as descriptive of the relative times of actuation and release of the actuating-pawl in a broad sense as denoting a time of release subsequent to a time of actuation and prior to the next following use of the instrument for recording purposes. It may also be noted that the term "rack" is used in a broad sense to denote any toothed member adapted to perform the functions set forth with regard to this part.

It will thus be seen that we have provided simple and efficient means for accomplishing the several objects of our invention. The mechanism used, moreover, is of the simplest, most durable, and inexpensive construction, and the action of the same is positive and entirely automatic. It will also be seen that the alinement of records made by mechanism of the nature of that above described is without material error and that this perfection of alinement is attained without sacrifice of the free and yet positive action of the mechanism whereby the card-abutment is actuated. It will also be apparent that several features of our invention are of value in other relations, although peculiarly adapted for that herein shown, and that this invention may be used in connection with instruments now in use with slight alterations in the construction thereof.

As many changes could be made in the above construction and many apparently widely different embodiments of our invention could be made without departing from the scope thereof, we intend that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. We desire it also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which as a matter of language might be said to fall therebetween.

Having described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a time-recorder, in combination, printing mechanism, a stop adapted to limit the relative movement in one direction of a coacting record-card, a rack connected with said stop, actuating and holding pawls coacting with said rack, clock-actuated means adapted intermittently to operate said actuating-pawl, means adapted to release said pawls, and means upon said clock-actuated means adapted to actuate said releasing means.

2. In a time-recorder, in combination, printing mechanism, a stop adapted to limit the relative movement in one direction of a coacting record-card, a rack connected with said stop, actuating and holding pawls coacting with said rack, clock-actuated means adapted intermittently to operate said actuating-pawl, releasing means adapted to coact with said pawls, means controlled in accordance with the position of the said rack adapted to place said releasing means in operative condition and means upon said clock-actuated means adapted to operate said releasing means.

3. In a time-recorder, in combination, printing mechanism, a stop adapted to limit the relative movement in one direction of a coacting record-card, a rack connected with said stop, actuating and holding pawls coacting therewith, a clock-actuated member, means actuated from said clock-actuated member adapted upon the same rotating in one direction to operate said actuating-pawl and adapted upon said clock-actuated member rotating in the opposite direction to remain inoperative with respect to said actuating-pawl, and means controlled in accordance with the position of said rack and operated by means upon said clock-actuated member adapted to release said actuating and holding pawls.

4. In a time-recorder, in combination, printing mechanism, a stop adapted to limit the relative movement in one direction of a coacting record-card, a rack operatively connected with said stop, actuating and holding pawls coacting therewith, clock-actuated means adapted intermittently to operate said actuating-pawl, means adapted to release said pawls, means upon said clock-actuated means adapted to actuate said releasing means, and means controlled in accordance with the position of said rack adapted to place said releasing means in operative condition.

5. In a time-recorder, in combination, printing mechanism, a stop adapted to limit the movement in one direction of a coacting record-card, a rack connected with said stop, actuating and holding pawls coacting with said rack, clock-actuated means adapt-

ed intermittently to operate said actuating-pawl, means adapted to release said actuating and holding pawls, means on said clock-actuated means adapted to operate said releasing means, and means controlled in accordance with the position of said rack to move said releasing means into operative relation to both pawls.

6. In a time-recorder, in combination, printing mechanism, a stop adapted to limit the relative movement in one direction of a coacting record-card, a rack connected with said stop and actuating and holding pawls coacting therewith, clock-actuated means adapted intermittently to operate said actuating-pawl, a releasing member, means operated by said clock-actuated means adapted to operate said releasing member, and means carried by said rack adapted to throw said releasing member into operative relation to said actuating and said holding pawls.

7. In a time-recorder, in combination, printing mechanism, a stop adapted to limit the relative movement in one direction of a coacting record-card, a rack connected with said stop, actuating and holding pawls coacting therewith, a releasing member adapted to throw said actuating and holding pawls into inoperative position, clock-actuated means adapted intermittently to operate said actuating-pawl and to move said releasing member, and means controlled in accordance with the position of said rack adapted to throw said releasing member into operative relation to both said actuating and said holding pawls.

8. In a time-recorder, in combination, printing mechanism, a stop adapted to limit the relative movement in one direction of a coacting record-card, a rack connected with said stop, actuating and holding pawls coacting therewith, a clock-actuated member, a cam carried by said clock-actuated member adapted intermittently to operate said actuating-pawl, a releasing member adapted to swing into contact with said actuating and said holding pawls and throw the same into inoperative condition, means controlled by said clock-actuated member adapted to actuate said releasing member, and means carried by said rack adapted to move said releasing member into operative relation to both of said pawls.

9. In a time-recorder, in combination, printing mechanism, a stop adapted to limit the relative movement in one direction of a coacting record-card, a rack connected with said stop, actuating and holding pawls coacting therewith, a clock-actuated member, a cam carried by said clock-actuated member adapted upon being rotated in one direction intermittently to operate said actuating-pawl, a releasing member adapted to swing into contact with said actuating and said holding pawls and throw the same into inop-

erative position, means controlled by said clock-actuated member adapted to actuate said releasing member, means carried by said rack adapted to place said releasing member
 5 in operative relation to both of said pawls, and means adapted upon said clock-actuated member being rotated in the opposite direction to prevent the operation thereby of said actuating pawl or releasing member.

10 10. In a time-recorder, in combination, printing mechanism, a stop adapted to limit the relative movement in one direction of a coacting record-card, a rack connected with said stop, actuating and holding pawls coact-
 15 ing therewith, a clock-actuated member, a cam carried by said clock-actuated member adapted upon the same being rotated in one direction intermittently to operate said actuating-pawl and upon said clock-actuated
 20 member being rotated in an opposite direction to remain inoperative with respect to said actuating-pawl, a releasing member adapted to swing into contact with said actuating and said holding pawls and throw the
 25 same into inoperative position, means controlled by said clock-actuated member adapted to actuate said releasing member, means carried by said rack adapted to move said releasing member into operative relation to
 30 both of said pawls, and means adapted visually to indicate the position of said stop.

11. In a time-recorder, in combination, printing mechanism, a stop adapted to limit the relative movement in one direction of a
 35 coacting record-card, a toothed member operatively connected with said stop, means adapted to move said toothed member, means adapted to hold the same in a predetermined position, and means adapted to throw said
 40 toothed member upon said holding means.

12. In a time-recorder, in combination, printing mechanism, means controlling the position of a coacting record-receiving member, a toothed member operatively connected
 45 therewith, means adapted to actuate said toothed member and means adapted to remove said actuating means from engagement therewith immediately after each actuation thereof.

50 13. In a time-recorder, in combination, printing mechanism, means adapted to determine the position of a coacting record-receiving member, a toothed member operatively connected with said means, a pawl
 55 adapted to actuate said toothed member, a pawl adapted to hold the same substantially in the position in which it has been moved and means adapted to operate said actuating-pawl and to release the same from engage-
 60 ment with said rack immediately subsequent to each operation thereof.

14. In a time-recorder, in combination, printing mechanism, a stop adapted to limit the movement in one direction of a coacting
 65 record-card, a rack operatively connected

with said stop, actuating and holding pawls coacting with said rack, clock-actuated means adapted intermittently to operate said actuating-pawl, and means adapted to
 70 withdraw said actuating-pawl from engagement with said rack immediately subsequent to each operation thereof.

15. In a time-recorder, in combination, printing mechanism, a stop adapted to limit the relative movement in one direction of a
 75 coacting record-card, a rack operatively connected with said stop, an actuating-pawl coacting with said rack and adapted to raise the same, a holding-pawl adapted to swing beneath one of the teeth of said rack in the
 80 position into which it has been raised by said actuating-pawl, said holding-pawl having a clearance with reference to said tooth, clock-actuated means adapted to operate said actuating-pawl, and means adapted to release
 85 said actuating-pawl from said rack subsequent to each operation thereof and permit the same to rest upon said holding-pawl.

16. In a time-recorder, in combination, printing mechanism, a stop adapted to limit
 90 the relative movement in one direction of a coacting record-card, a rack operatively connected to said stop, an actuating-pawl coacting with said rack and adapted to raise the same, a holding-pawl adapted to swing be-
 95 neath one of the teeth of said rack in the position into which it has been raised by said actuating-pawl, said holding-pawl having a clearance with reference to said tooth, clock-actuated means adapted to operate said actu-
 100 ating-pawl, means adapted to release said actuating-pawl from said rack subsequent to the operation thereof and permit the same to rest upon said holding-pawl, and means adapted to release both pawls upon said rack
 105 being moved throughout a predetermined distance.

17. In a time-recorder, in combination, printing mechanism, a stop adapted to limit the relative movement in one direction of a
 110 coacting record-card, a rack operatively connected with said stop, actuating and holding pawls coacting with said rack, clock-actuated means adapted intermittently to operate said actuating-pawl, means adapted to re-
 115 lease said pawls, means upon said clock-actuated means adapted to actuate said releasing means, and means adapted immediately subsequent to each operation of said actuating-pawl to withdraw the same from engagement
 120 with said rack and permit said rack to be supported by said holding-pawl.

18. In a time-recorder, in combination, printing mechanism, a stop adapted to limit the relative movement in one direction of a
 125 coacting record-card, a rack operatively connected with said stop, actuating and holding pawls coacting therewith, clock-actuated means adapted intermittently to operate said actuating-pawl, means adapted to re-
 130

lease said pawls, means controlled in accordance with the position of said rack adapted to place said releasing means in operative condition, and means adapted immediately subsequent to each operation of said actuating-pawl to withdraw the same from engagement with said rack.

19. In a time-recorder, in combination, printing mechanism, a stop adapted to limit the relative movement in one direction of a coacting record-card, a rack operatively connected with said stop, actuating and holding pawls coacting therewith, clock-actuated means adapted upon being driven in one direction intermittently to operate said actuating-pawl and upon being driven in the opposite direction to remain inoperative with respect to said actuating-pawl, means adapted to release said pawls means controlled in accordance with the position of said rack adapted to place said releasing means in operative condition, and means adapted immediately subsequent to each operation of said actuating-pawl to withdraw the same from engagement with said rack.

20. In a time-recorder, in combination, printing mechanism, a stop adapted to limit the relative movement in one direction of a coacting record-card, a rack operatively connected with said stop, actuating and holding pawls coacting therewith, clock-actuated means adapted intermittently to operate said actuating-pawl, means adapted to release said pawls from engagement with said rack, means controlled in accordance with the position of said rack adapted to place said releasing means in operative condition and means controlled by said clock-actuated means adapted to cause said releasing means to withdraw said actuating-pawl from operative relation with said rack immediately subsequent to each operation thereof.

21. In a time-recorder, in combination, printing mechanism, a stop adapted to limit the relative movement in one direction of a coacting record-card, a rack operatively connected with said stop, actuating and holding pawls coacting therewith, clock-actuated means adapted upon being rotated in one direction intermittently to operate said actuating-pawl and upon being rotated in the opposite direction to remain inoperative with respect to said actuating-pawl, means adapted to release said pawls from engagement with said rack, means controlled in accordance with the position of said rack adapted to place said releasing means in operative condition, and means controlled by said clock-actuated means adapted to withdraw said actuating-pawl from operative relation with said rack immediately subsequent to each operation thereof.

22. In a time-recorder, in combination, printing mechanism, means controlling the position of a coacting record-receiving mem-

ber with relation to the printing mechanism, a member operatively connected with said means, means adapted to actuate said member, and means adapted to remove said actuating means from engagement with said member immediately after each actuation thereof.

23. In a time-recorder, the combination of printing mechanism, means to determine the position of a card relative to said mechanism, actuating means arranged to engage said determining means to impart an intermittent step-by-step movement thereto, a holding device to hold the determining means in each of the positions to which it is moved and means to disengage the actuating means from the determining means after each actuation of the latter.

24. In a time-recorder, the combination of printing mechanism, means to determine the position of a card relative to said mechanism, actuating means arranged to engage said determining means to impart an intermittent step-by-step movement thereto, a holding device to hold the determining means in each of the positions to which it is moved, means to disengage the actuating means from the determining means after each actuation of the latter, and means to cause the disengaging means to move both the actuating and holding means from operative engagement with the determining means after the latter has completed a cycle of movements.

25. In a time-recorder, the combination of printing mechanism, means to determine the position of a card relative to said mechanism, actuating means arranged to engage said determining means to impart an intermittent step-by-step movement thereto, a holding device to hold the determining means in each of the positions to which it is moved, means to disengage the actuating means from the determining means after each actuation of the latter, and means operating in accordance with the position of the determining means, to cause the disengaging means to move both the actuating and holding means from operative engagement with the determining means after the latter has completed a cycle of movements.

26. In a time-recorder, the combination of printing mechanism, means to determine the position of a card relative to said mechanism, actuating means arranged to engage said determining means to impart an intermittent step-by-step movement thereto, a holding device to hold the determining means in each of the positions to which it is moved, and clock-actuated means for disengaging the actuating means from the determining means after each actuation of the latter.

27. In a time-recorder, the combination of printing mechanism, means to determine the position of a card relative to said mechanism, a clock-controlled actuating means arranged

to engage said determining means to impart an intermittent step-by-step movement thereto, a holding device to hold the determining means in each of the positions to which it is moved, and clock-actuated means for disengaging the actuating means from the determining means after each actuation of the latter.

28. In a time-recorder, the combination of a printing mechanism, means to determine the position of a card relative to said mechanism, clock-controlled actuating means arranged to engage said determining means to impart an intermittent step-by-step movement thereto, and clock-actuated means for disengaging the actuating means from the determining means after each actuation of the latter.

29. In a time-recorder, the combination of a printing mechanism, a card-stop movable relative to the printing mechanism, clock-controlled actuating means arranged to engage said stop to impart thereto an intermittent step-by-step movement, a holding device to hold the stop in the several positions to which it is moved, a releasing device to disengage the actuating means from the stop after each movement of the latter and operating in accordance with the position of the stop to disengage both the actuating means and the holding device from the stop after the stop has completed a cycle of movements.

30. In a time-recorder, the combination of a printing mechanism, a card-stop movable relative to the printing mechanism, clock-controlled actuating means arranged to engage said stop to impart thereto an intermittent step-by-step movement, a holding device to hold the stop in the several positions to which it is moved, means to automatically disengage the actuating means from the stop after each movement of the latter and means to disengage both the actuating and holding means from the stop when the latter has completed a cycle of movements.

31. In a time-recorder, in combination, printing mechanism, a stop adapted to limit the movement in one direction of a coacting record-card, a toothed member connected with said stop, actuating and holding pawls coacting with said toothed member, clock-controlled means adapted upon rotation in one direction intermittently to operate said actuating-pawl, and adapted to be rotated in a reverse direction without affecting said actuating-pawl.

32. In a time-recorder, in combination, printing mechanism, a stop adapted to limit the movement in one direction of a coacting record-card, a toothed member connected with said stop, actuating and holding pawls coacting therewith, and a clock-actuated cam adapted upon rotation in one direction intermittently to operate said actuating-

pawl, said cam being mounted to become ineffective to operate said actuating-pawl upon rotation in the opposite direction.

33. In a time-recorder, in combination, printing mechanism, a movable abutment adapted to limit the movement in one direction of a coacting record-card, a toothed member operatively connected with said abutment, an actuating-pawl and a holding-pawl coacting with said toothed member, clock-actuated means adapted to operate said actuating-pawl, and means controlled by said toothed member and movable relative thereto to throw said holding member into inoperative position.

34. In a time-recorder, in combination, a toothed member, holding and actuating pawls coacting therewith, a clock-controlled means adapted intermittently to operate said actuating-pawl, a single automatically-acting means adapted simultaneously to maintain said holding and said actuating pawls out of engagement with said toothed member, and means adapted to render said last-mentioned means operative upon said actuating-pawl being operated a predetermined number of times.

35. In a time-recorder, in combination, printing mechanism, an abutment adapted to limit the movement in one direction of a coacting record-card, a toothed member operatively connected with said abutment, holding and actuating pawls coacting with said toothed member, clock-controlled means adapted intermittently to operate said actuating-pawl, and a single member adapted upon said actuating-pawl being operated a predetermined number of times to hold said actuating and holding pawls simultaneously out of engagement with said toothed member.

36. In a time-recorder, in combination, printing mechanism, an abutment adapted to limit the movement in one direction of a coacting record-card, a toothed member operatively connected with said abutment, holding and actuating pawls coacting with said toothed member, clock-controlled means adapted intermittently to operate said actuating-pawl, and a single member adapted upon said actuating-pawl being operated a predetermined number of times to hold said actuating and holding pawls simultaneously out of engagement with said toothed member, said last-mentioned single member being controlled in accordance with the position of said toothed member.

37. In a time-recorder, in combination, printing mechanism, an abutment adapted to limit the movement in one direction of a coacting record-card, a clock-actuated member, means adapted to be actuated by the rotation of said clock-actuated member in one direction to move said abutment, said clock-

actuated member being ineffectual for the operation of said moving means upon being rotated in the opposite direction.

38. In a time-recorder, in combination, 5 printing mechanism, an abutment adapted to limit the movement in one direction of a coacting record-card, a clock-actuated member, means adapted to move said abutment, a cam upon said clock-actuated member 10 adapted to actuate said moving means upon said cam being rotated in one direction, said cam being ineffectual for the operation of said moving means upon being rotated in another direction.

39. In a time-recorder, in combination, 15 printing mechanism, an abutment adapted to limit the movement in one direction of a coacting record-card, means adapted to move said abutment, a rotatable clock-actuated member, and a cam on said clock-actu-

ated member pivoted at a point eccentric to the axis thereof adapted to engage and actuate said moving means.

40. In a time-recorder, in combination, 25 printing mechanism, an abutment adapted to limit the movement in one direction of a coacting record-card, means adapted to move said abutment, a clock-actuated member, a cam pivoted on said clock-actuated member eccentric to the axis thereof adapted 30 to engage and actuate said moving means, and a stop adapted to limit the movement of said cam in a direction away from said axis.

In testimony whereof we affix our signatures in the presence of two witnesses.

JOHN DEY.

ALEXANDER DEY.

Witnesses:

CARRIE MAY JUNE,

CLARA SACKETT RAYMOND.