

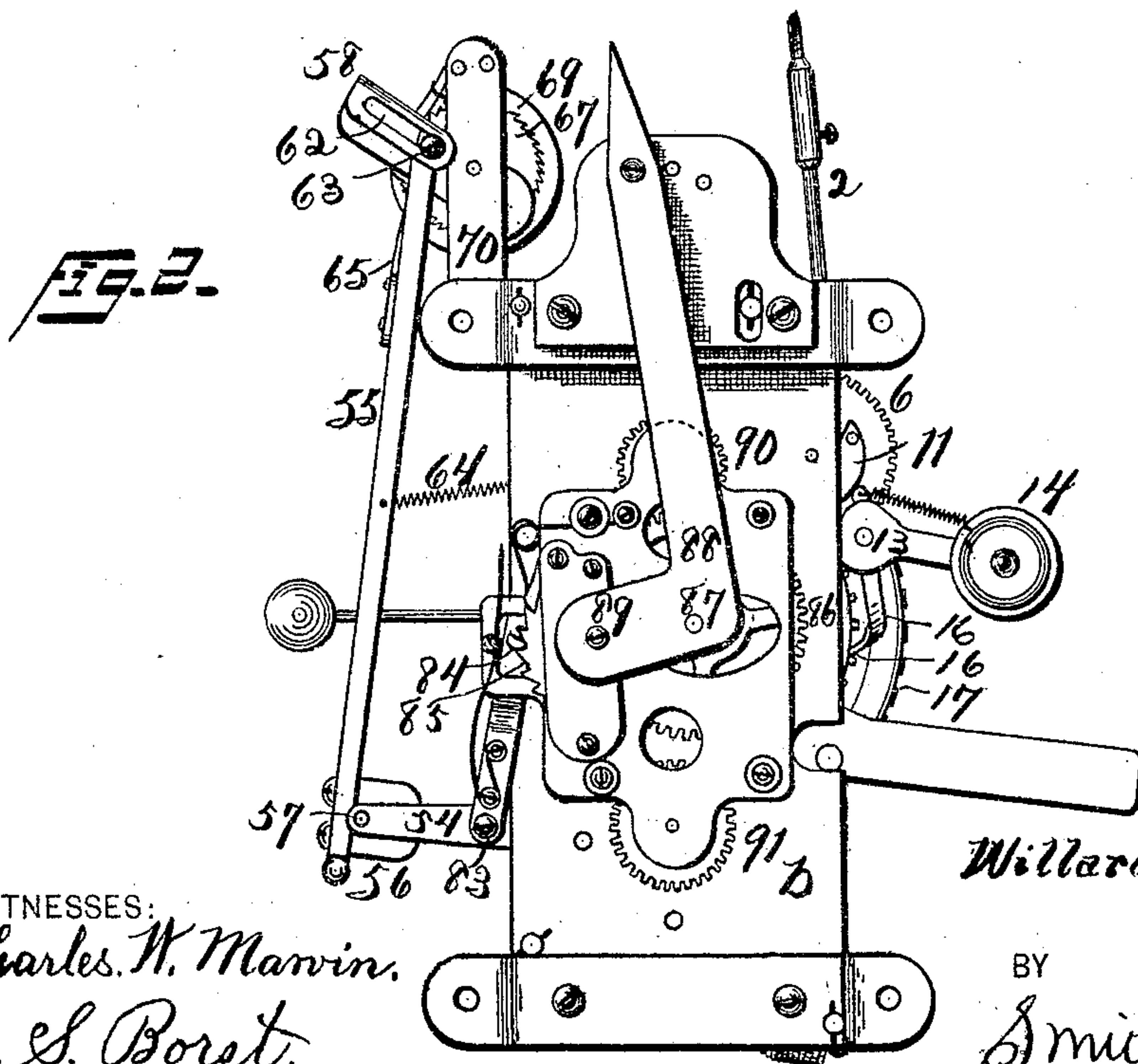
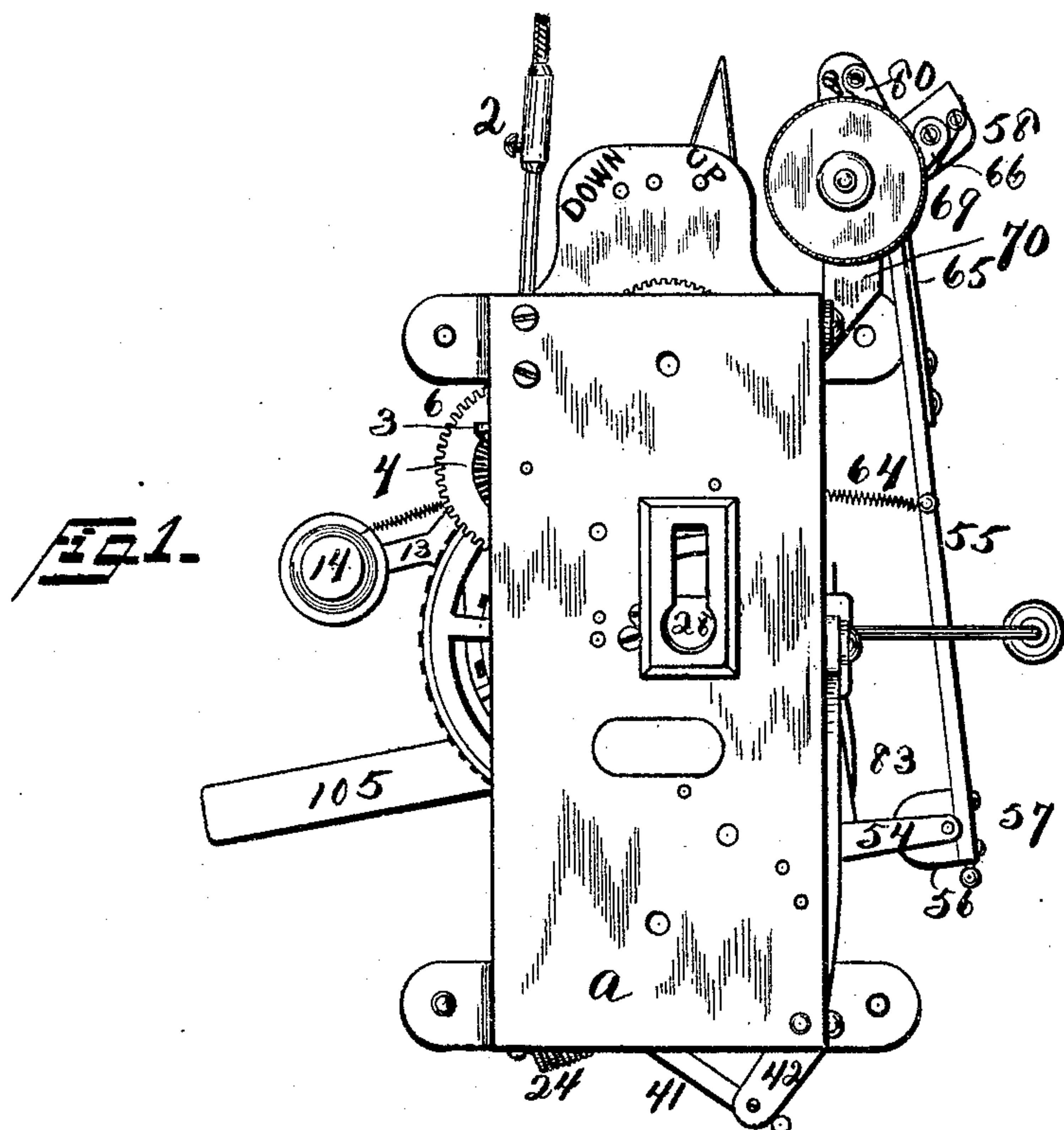
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7 Sheets—Sheet 1.

W. L. BUNDY.
WORKMAN'S TIME RECORDER.

No. 553,804.

Patented Jan. 28, 1896.



WITNESSES:
Charles W. Marvin.
E. S. Boret.

INVENTOR
Willard L. Bundy.

BY
Smith & Benson
ATTORNEYS.

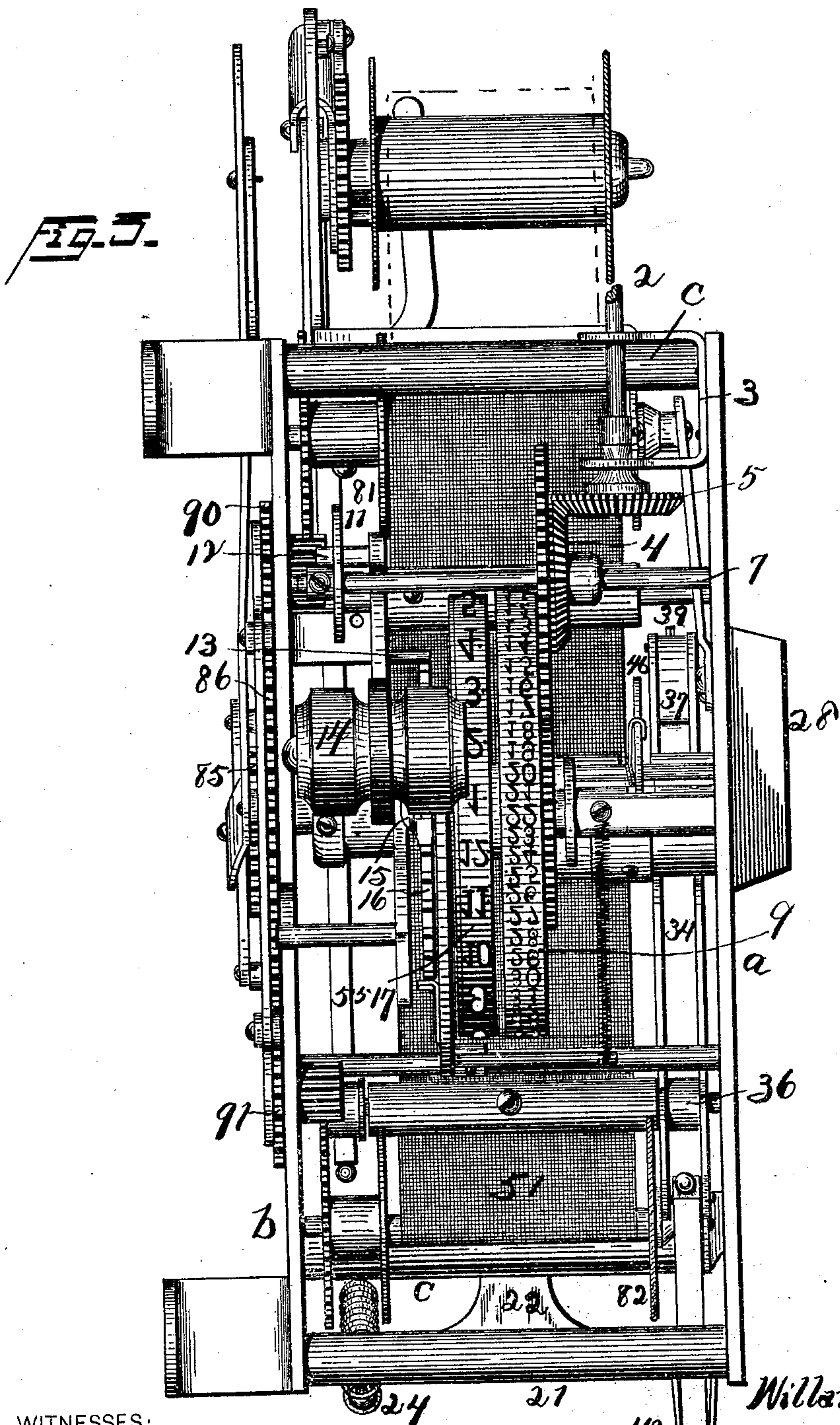
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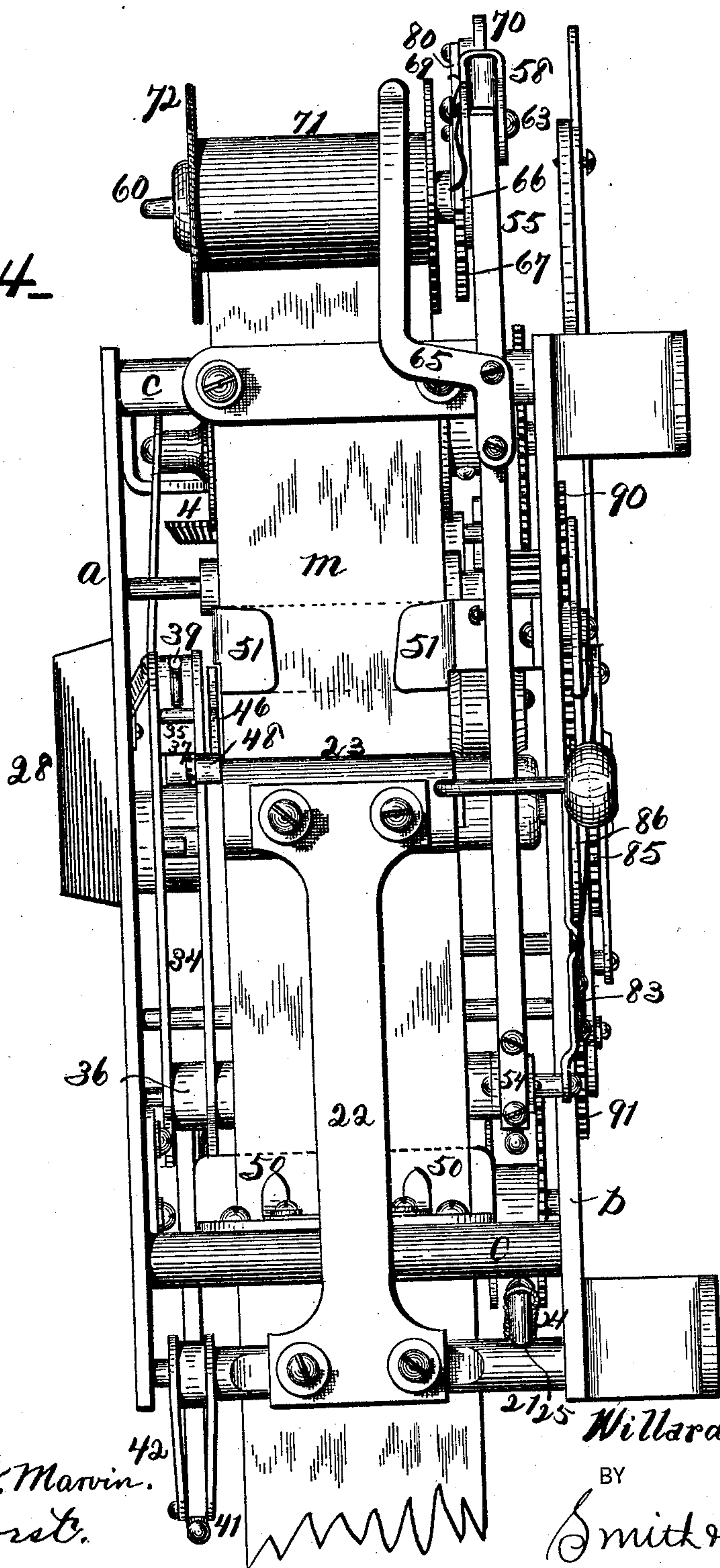
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Fig. 4.



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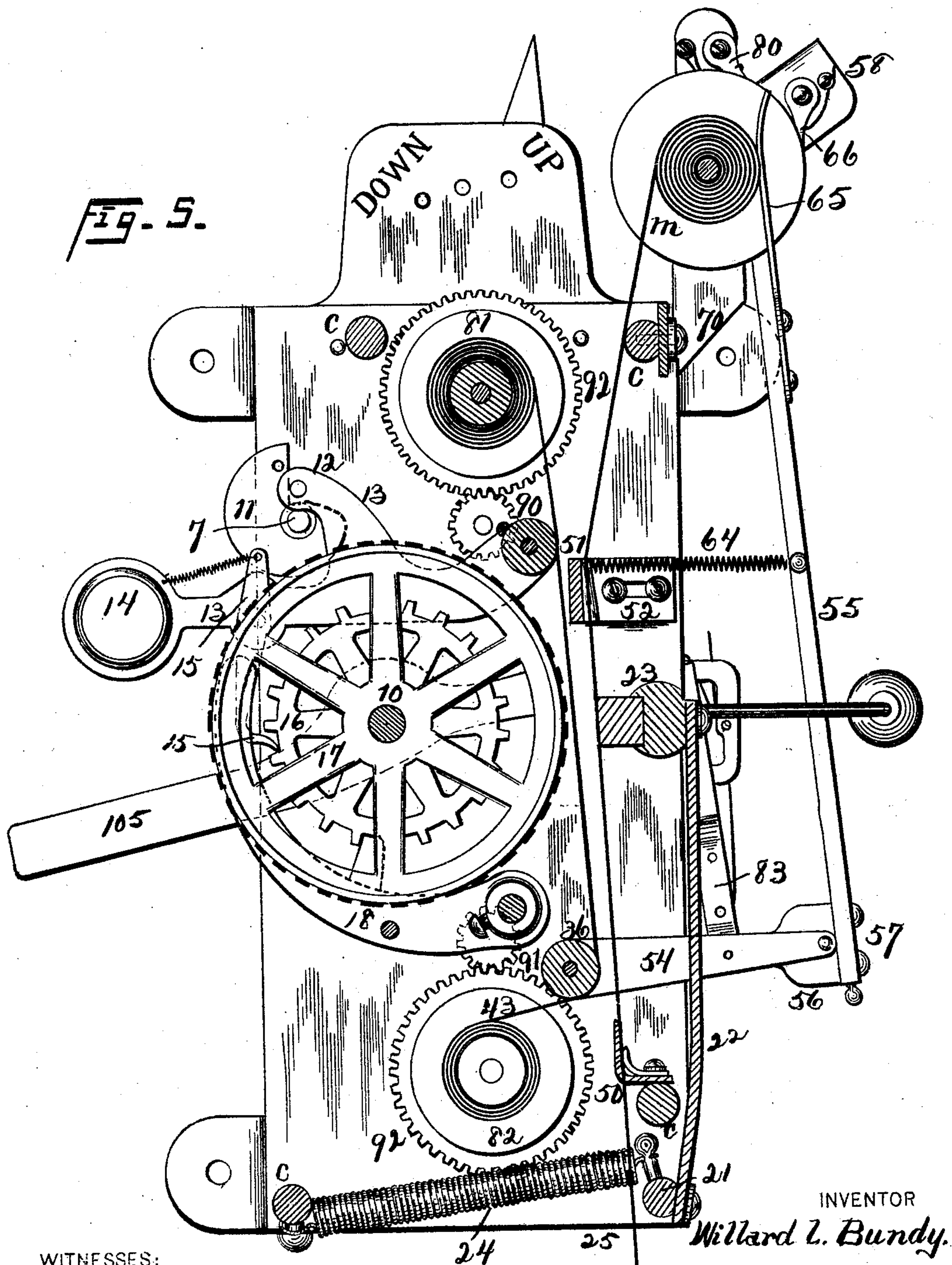
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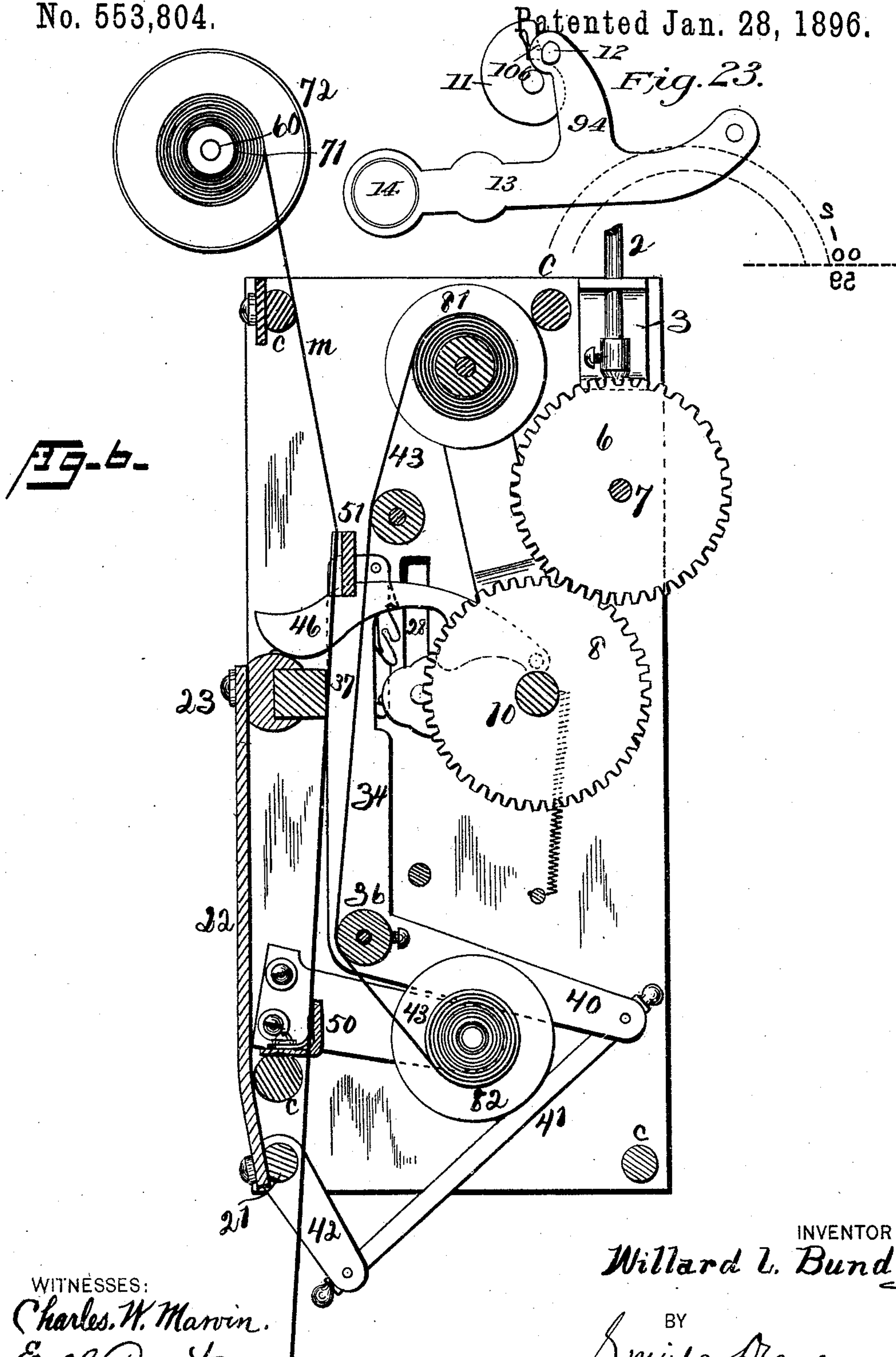
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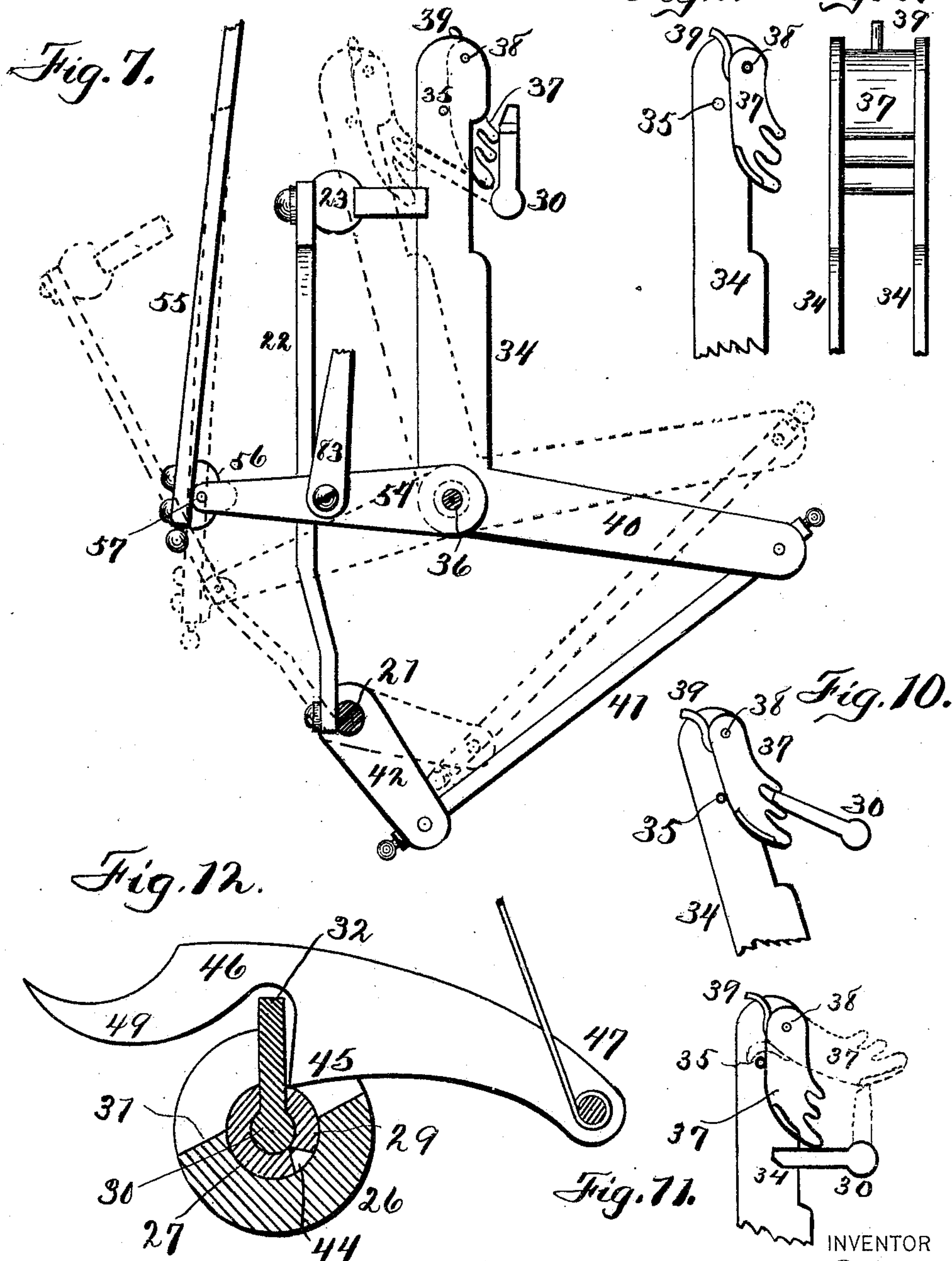
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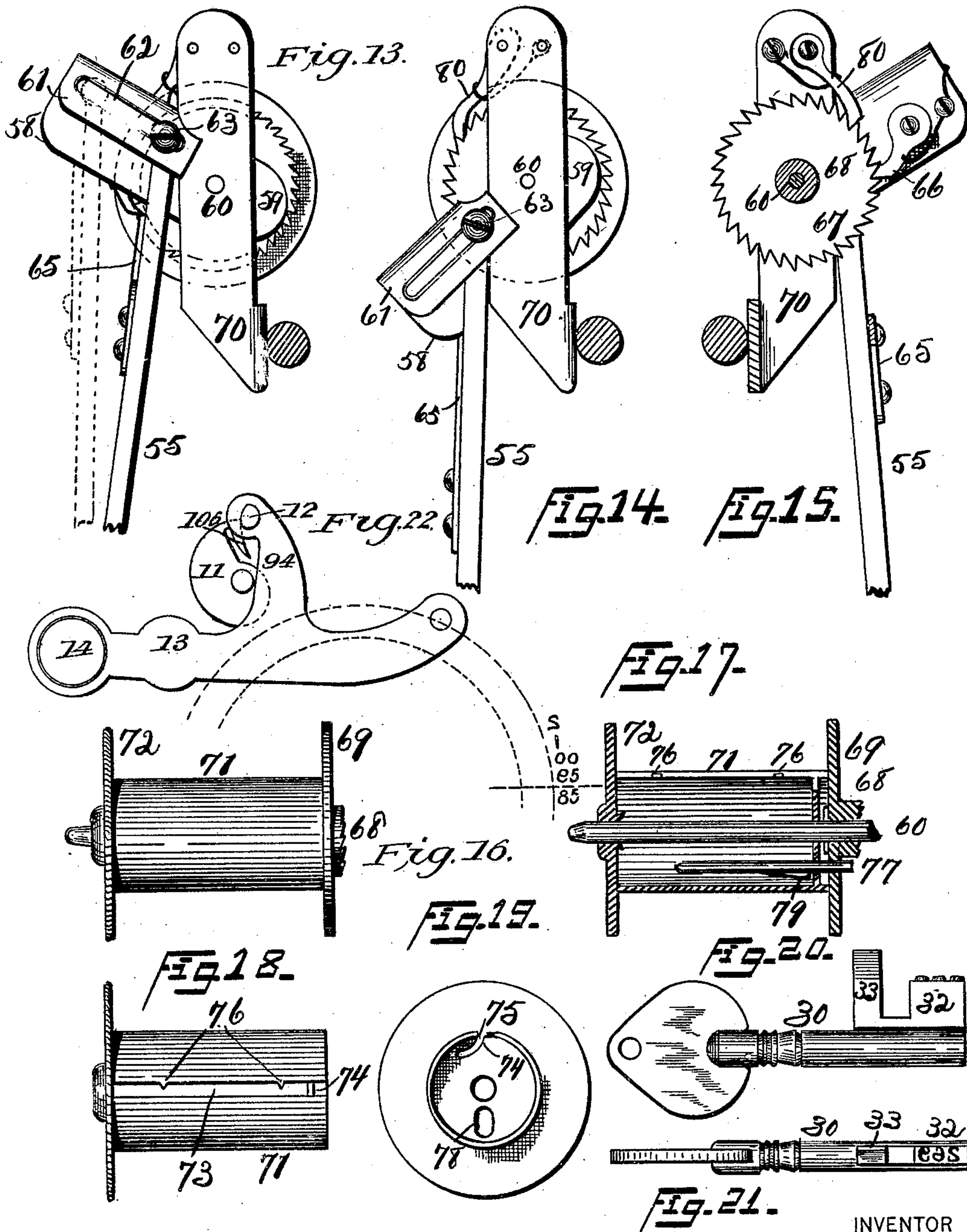
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UNITED STATES PATENT OFFICE.

WILLARD L. BUNDY, OF BINGHAMTON, NEW YORK, ASSIGNOR TO THE
BUNDY MANUFACTURING COMPANY, OF SAME PLACE.

WORKMAN'S TIME-RECORDER.

SPECIFICATION forming part of Letters Patent No. 553,804, dated January 28, 1896.

Application filed November 10, 1894. Serial No. 528,396. (No model.)

To all whom it may concern:

Be it known that I, WILLARD L. BUNDY, of Binghamton, in the county of Broome, in the State of New York, have invented new and
5 useful Improvements in Workmen's Time-Recorders, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to workmen's time-
10 recorders, and particularly to that class in which a numbered key is used to designate each workman by its numeral, and which is inserted into the machine, turned to actuate the printing mechanism, and then removed,
15 leaving said numeral and the hour and minute numerals printed onto a strip of paper, the latter numerals being carried upon time-wheels which are connected to and synchronous with a clock-movement.

20 Several patents have heretofore been granted to me for machines of this class—viz., No. 393,205, dated November 20, 1888, No. 453,230, dated June 2, 1891, and No. 452,894, dated May 26, 1891; and the object of this inven-
25 tion is to improve the construction of the machine, increase its utility and durability, and to provide it with additional safeguards, such as have been developed by the manufacture, sale, and use thereof; and to that end my inven-
30 tion consists in the several novel features of construction and operation hereinafter described, and which are specifically set forth in the claims hereunto annexed. It is constructed as follows, reference being had to
35 the accompanying drawings, in which—

Figure 1 is a front elevation of the machine. Fig. 2 is a rear elevation thereof. Fig. 3 is a side elevation thereof on a larger scale. Fig. 4 is a like view of the same on the opposite
40 side. Fig. 5 is a vertical transverse section looking from the front. Fig. 6 is a like view looking from the rear. Fig. 7 is a detail in front elevation of the system of levers and rods actuated by the turning of a key, pre-
45 viously inserted, to throw the impression-platen into printing position and to operate the paper-feed, the dotted lines indicating the movements of the several parts. Fig. 8 is a detail in front elevation of the key-lock-
50 ing pawl and its mounting. Fig. 9 is a side

elevation of the same. Fig. 10 is a front elevation of the same, showing a key locked. Fig. 11 is a like view showing the key fully turned, the dotted lines showing the position assumed by the pawl when the key is turned
55 back from the position in full lines. Fig. 12 is a detail in front elevation of a mechanism for locking the key when turned over to the position shown in Fig. 10, whereby it cannot
60 be removed until after the impression of its numeral has been made. Fig. 13 is a rear elevation of the paper-wind-up spool, its ratchet, and the pawl mechanism for rotating it, actuated by the turning of a key. Fig.
65 14 is a like view of the same, showing the parts in their normal position. Fig. 15 is a sectional detail of the ratchet-and-pawl mechanism in the position shown in Fig. 12. Fig. 16 is a side elevation of the spool onto which
70 the paper is wound. Fig. 17 is a transverse sectional elevation of the same. Fig. 18 is a top plan view of the spool-body moved from its holder. Fig. 19 is an end elevation of the same. Figs. 20 and 21 are details of the key
75 used to designate a workman. Fig. 22 is a detail of the mechanism for actuating the hour-wheel, and also for simultaneously actuating the minute-wheel to shift it from 59 to
80 00 when the hour-wheel is moved to change the hour. Fig. 23 is a like view of the same parts, showing the shifting-cam rotated so as to drop the lever and also to be thereby thrown forward far enough so as to exert a force back through its actuating-gearing sufficient to rotate the minute-wheel one space, as from 59
85 to 00, as shown.

The machine contains a front plate, *a*, and a back plate, *b*, and *c* are corner-posts connecting them. A shaft 2 is connected to and rotated by a clock-movement, (not shown,) 90 and 3 is a bracket supporting and guiding it, and by the bevel-gears 4 5 the spur-gear 6 and shaft 7, the spur-gear 8 and the minute-wheel 9, loose upon the arbor 10, are rotated so that this minute-wheel is synchronous with the
95 minute-hand of the clock. The rotation of the shaft 7 rotates the cam 11, which engages with the stud 12 to lift the lever 13, which is provided with a counterbalance 14 and a spring-pawl 15, which normally engages with 100

the ratchet-wheel 16, secured upon the hour-wheel 17 and shifts said pawl once in each hour into engagement with the next tooth, and 18 is a stop-pawl to prevent the backward rotation of said hour-wheel, which is thus shifted once in each hour, all substantially as shown and described in an application filed by me December 9, 1893, Serial No. 493,120, and wherein this mechanism is claimed.

A rock-shaft 21 is journaled in the front and back plates. 22 is a helve secured thereto. 23 is the platen or hammer secured upon said helve, and 24 is a spring connected to an arm 25 on said rock-shaft and operating it to hold said platen normally in substantially the position shown in Fig. 5.

A bar or sleeve 26, Fig. 12, is secured to the inner face of the front plate and concaved, as at 27, and cut away on top, substantially as shown, said concavity being in alignment with the keyhole 28, and 29 is a tube fitting rotatably in said concavity, adapted to receive the stem of the key 30 and slotted longitudinally to permit the bit or ward to enter, so that the turning of the key rotates said sleeve, and when turned one-quarter of a circle the bit or ward will strike the face 31 of the bar 26 and stop the key. The key is provided with a ward 32, having upon its outer end the numerals or characters used to designate a workman, and an arm 33 beveled or scarfed off on its outer end, as shown in Fig. 10.

A frame 34 consisting of two parallel bars united by a rod 35 is secured to a rock-shaft 36, and 37 is the key-lock gravity-pawl pivoted upon an arbor 38 in said frame and provided with teeth on its face with which the key-arm engages when the key is turned, and thereby the key cannot be turned back and removed until it has fully passed said teeth, and then said arm will engage with the back thereof and tilt it, substantially as shown in Fig. 11, when the key can be withdrawn, and the pawl will drop back into its normal position, as shown in Fig. 8. As shown in this figure and also in Figs. 10 and 11, said pawl is provided with a lug 39, which will engage with the rod 35 when it is tilted and which thus regulates and limits the degree of said tilting and prevents its being thrown over back out of the path of the key-arm, which, if it occurred, would disable the machine. As this pawl normally lies against the rod 35, the turning of the key swings said frame 34, rocks the shaft 36, swings the lever 40, and through the connecting-rod 41 and crank-arm 42, secured to the rock-shaft 21, rocks said shaft to throw the platen into the position shown in Fig. 7 by the dotted lines, ready to strike an impression-blow, producing a torsion upon the spring 24, so that when said key-arm reaches the limit of its movement the numerals upon the key are upon the printing-line, and said frame is released, so

that said spring impels the piston to strike an impression-blow and print the key-numeral and the hour and minute numerals of the time-wheels, which are then upon the printing-line, upon a paper strip *m* by the aid of an ink-ribbon 43.

In the key-tube a notch 44 is cut, Fig. 12, and when the key is turned said tube is rotated, and when the key is stopped the point 45 of the pawl 46 drops into this notch, aided by the spring 47, and this locks the key-bushing 29 and not only prevents it from being turned back, although it has passed the lock-pawl 37, but also holds it in that one position until the impression-platen strikes its blow, and when this occurs the stud 48 on the platen strikes the beveled end 49 of this pawl 46 and raising it out of said notch releases the key to be removed.

The paper strip is conducted from a suitable reel (not shown) through a guide 50, Fig. 5, thence upward in front of the platen and through a guide 51, which is adjustable by means of the slot and screw 52, and thence extends upward to the wind-up spool 71.

An arm 54 is secured to the shaft 36. A rod 55 is loosely pivoted in or upon said arm by a pivot-pin 57 through a head 56 upon said rod, said rod being connected to the pawl-holder 58, Figs. 13, 14 and 15, which comprises an arm 59 pivoted upon the spool-shaft 60, a flange 61 having a slotway 62 through which a screw 63 fits loosely connecting it to the rod 55. A spring 64 is connected to said rod and to the paper-guide 51, and exerts its tension to yieldingly hold the finger 65 on said rod in contact with the paper upon the spool 71 and to hold the lower end of said rod (or its head) to a bearing upon the pivot 57 and thereby adjust the relations of the pawl mechanism, rod 55 and its finger to the arm 54.

The rocking of the shaft 36 vertically oscillates the arm 55, and as the feed of the paper strip should be such as to evenly space the records made thereon, and inasmuch as such spacing would naturally be varied proportionally to the increase of the amount of paper wound upon the spool, if the spool was uniformly rotated the same distance each time the shaft was rocked, this mechanism is devised so that said spring permits variation of the position of the screw 63 in the slot 62 in the arm 59 according to the amount of paper upon the spool when the arm 54 is in its normal position. Then when said arm is depressed the rotation of the spool is varied relatively to the position of said screw 63 in said slot, the finger 65 regulating such position by its bearing upon the paper, and thus automatically regulates the rotation of said spool and the spacing of the records thereon. The spool is rotated by means of a spring push-pawl 66 on the holder 58 engaging with a ratchet 67 secured to a sleeve upon the spool-shaft, and 69 is one of the spool-heads also secured to said sleeve, said spool-shaft being

carried by a bracket 70 erected upon a corner-post.

The drum of the spool is tubular, and 72 is the outer head thereon, said drum being provided with a longitudinal slot 73 and a head 74 within said drum, notched, as at 75, coincident with said slot, and 76 are teeth upon the edge of said slot which engage with the paper to hold its end upon the spool.

10 In the spool-head 69 a stem 77 is secured and adapted to pass through a slot 78 in said drumhead 74 and connects said spool-drum to the inner head 69, so that all rotate together, said stem being provided with a spring-catch 79, which detachably holds said drum
15 in position, so that at any time the drum can be readily pulled off from said shaft for the inspection or removal of the printed paper strip wound thereon. A check-pawl 80 en-
20 gages with said ratchet to prevent any backward rotation of the spool. The ribbon 43 is connected to the spools 81 and 82 and is wound from one onto the other by the following mechanism, shown and described in my applica-
25 tion aforesaid, and which comprises a rod 83 connected to the arm 54 and carrying a pawl 84 in engagement with a ratchet 85, and this rotates the gear 86, which is journaled upon an arbor 87 secured to a swinging bar 88 piv-
30 oted at 89, so that by shifting said bar said gear is shifted out of its engagement with one pinion 90 or 91 into engagement with the other, said pinions engaging with gears 92 upon the shafts of the respective ribbon-
35 spools, whereby a step-by-step rotation is imparted to one spool to wind the ribbon from the other each time a key is inserted and turned to vibrate the impression-platen.

In Figs. 22 and 23 the cam 11 is shown as
40 provided with a slit in its straight face, whereby a tongue 106 is created, said tongue being adjustable as to its projection beyond the direct line of its face. From this it results that as said cam is driven by the same train of
45 gearing and connection to the clockworks so when the cam passes the stud 12 and the lever falls to shift the hour-wheel at the same time it strikes the tongue and forces the cam to rotate forward far enough to cause the
50 train of gearing to be rotated so as to rotate the minute-wheel one space simultaneously with the movement of the hour-wheel. This is essential where the minute-wheel has normally only a regular forward movement,
55 whereby when, for instance, the two wheels indicate 6:59 the rotation of the cam causes the hour-wheel to shift while the minute-wheel is still at 59, so that the time on the paper strip indicates 7:59, whereas it should
60 show 7:00, which fault is wholly remedied by the above device.

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

65 1. In a workman's time-recorder, the combination with a rotatable sleeve receiving the

workman's key when inserted and provided with a notch, a pawl adapted to engage with said notch and lock the key when the sleeve is rotated by its turning, of a swinging pawl 70 with which the key engages as it is being turned forward and adapted to be tilted by the key when it is turned back for removal.

2. In a workman's time-recorder, the combination with a rotatable sleeve receiving the 75 workman's designating-key when inserted, and provided with a notch, a pawl adapted to engage with said notch and lock the key when the sleeve is rotated by its turning, of a swinging pawl, an oscillatory frame in which 80 it is mounted actuated by the engagement of the key as it is being turned forward with said pawl, and an impression-platen actuated by the oscillation of said frame, and engaging with said sleeve-locking pawl to release it 85 when it strikes an impression-making blow.

3. In a workman's time-recorder a spool comprising a body provided with a head and slotted longitudinally and toothed as shown, a separate head upon a sleeve, a catch engag- 90 ing with said body and means to rotate said spool, substantially as and for the purposes set forth.

4. In a workman's time-recorder, a rotatable spool and ratchet thereon, in combina- 95 tion with a pivoted pawl-holder a pawl thereon engaging with said ratchet, a slot in said holder, an operating rod connected to said slot, a spring engaging with said rod, and means to reciprocate said rod vertically, sub- 100 stantially as described.

5. In a workman's time-recorder, a rotatable spool and a ratchet thereon, in combination with a pivoted pawl-holder, a pawl there- 105 on engaging with said ratchet, a slot in said holder, a rod connected to said slot, a spring engaging with said rod, a finger upon said rod engaging with said spool and means to reciprocate said rod vertically, as and for the 110 purposes set forth.

6. In a workman's time-recorder, a rotatable spool consisting of sections detachably 115 connected together, and a ratchet on one section, in combination with a pivoted pawl-holder, a pawl thereon engaging with said ratchet, a slot in said holder, a rod connected to said slot, a spring engaging with said rod, a finger upon said rod engaging with said spool and means to reciprocate said rod vertically, 120 as and for the purposes set forth.

7. In a workman's time-recorder, a paper strip and a spool therefor, in combination with a driving pawl and ratchet, a pivoted pawl- 125 holder slotted longitudinally, an actuating-rod having its bearing in said slot and means to shift said bearing therein according to the amount of paper wound onto the spool, substantially as shown and described.

8. In a workman's time-recorder, an oscillatory frame, a shaft rocked thereby, an arm 130 upon said shaft, a rod connected thereto, a pivoted pawl-holder slotted longitudinally

and in which said rod has a bearing, in combination with a paper strip, a spool therefor and means to shift the bearing of said rod in said slot according to the amount of paper
5 upon the spool, substantially as shown and described.

9. In a workman's time-recorder, a rotatable sleeve adapted to receive a key, and a notch upon said sleeve, in combination with
10 a pawl adapted to engage with said notch when said sleeve is rotated by the turning of said key, as and for the purposes set forth.

10. In a workman's time-recorder, a rotatable sleeve adapted to receive a key and a
15 notch upon said sleeve, in combination with a pawl adapted to engage with said notch to lock said key when it is turned, and a vibratory impression-platen actuated by the turn-

ing of said key, and adapted to engage with said pawl to release said key, substantially
20 as shown and described.

11. The combination with the time-wheels and a lever for shifting the hour-wheel, of a shifting-cam engaging with said lever and a projection upon the straight face of said cam
25 with which said lever engages when it drops, and whereby said cam is given a forward impulse to rotate the minute-wheel one space simultaneously with the shifting of the hour-wheel.
30

In witness whereof I have hereunto set my hand on this 25th day of October, 1894.

WILLARD L. BUNDY.

In presence of—

HARLOW E. BUNDY,

CHARLES N. BRIGGS.