(No Model.) 5 Sheets—Sheet 1.

W. LE G. BUNDY.

WORKMAN'S TIME RECORDER.

No. 452,894. Patented May 26, 1891.

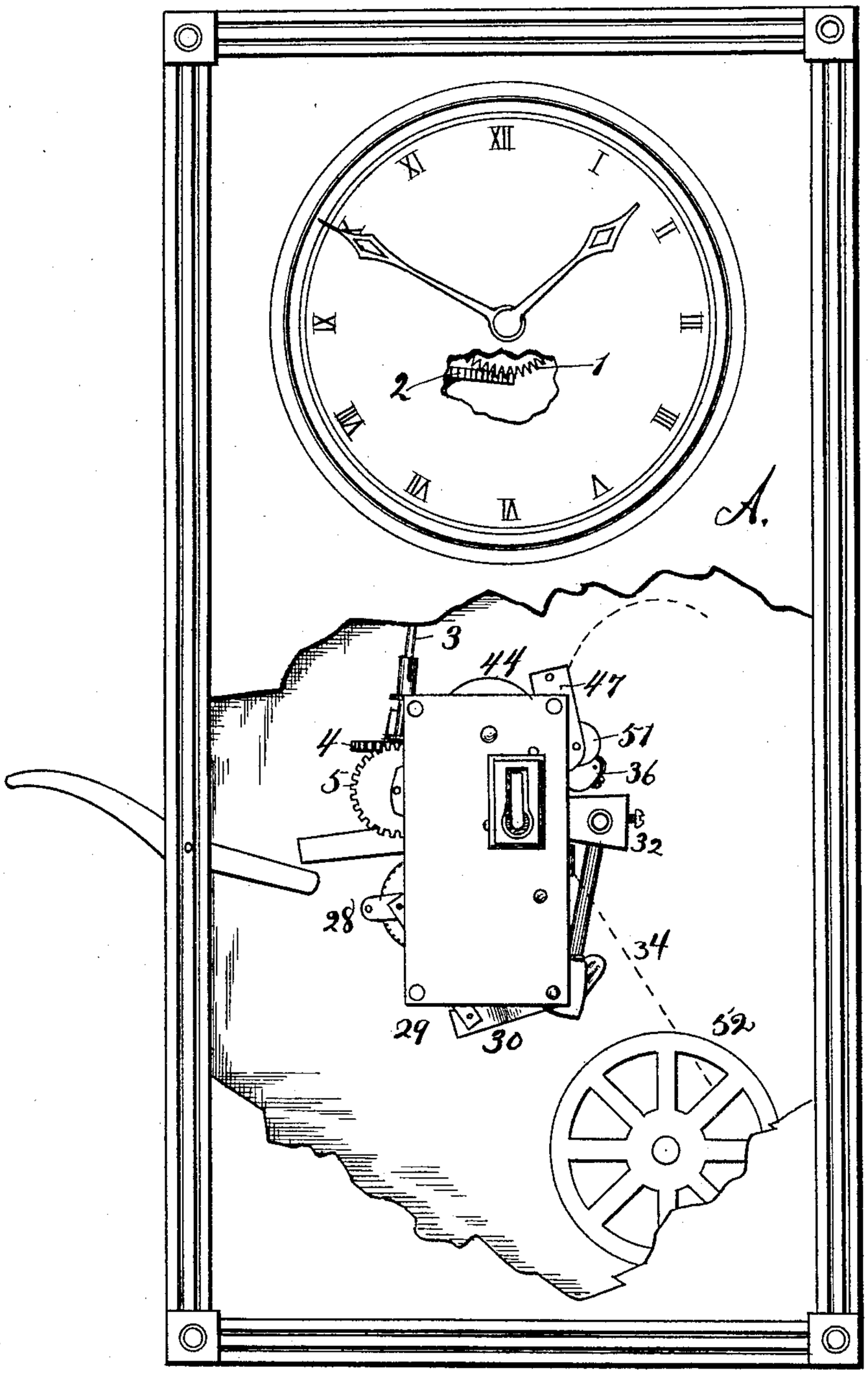

Fig. 1.

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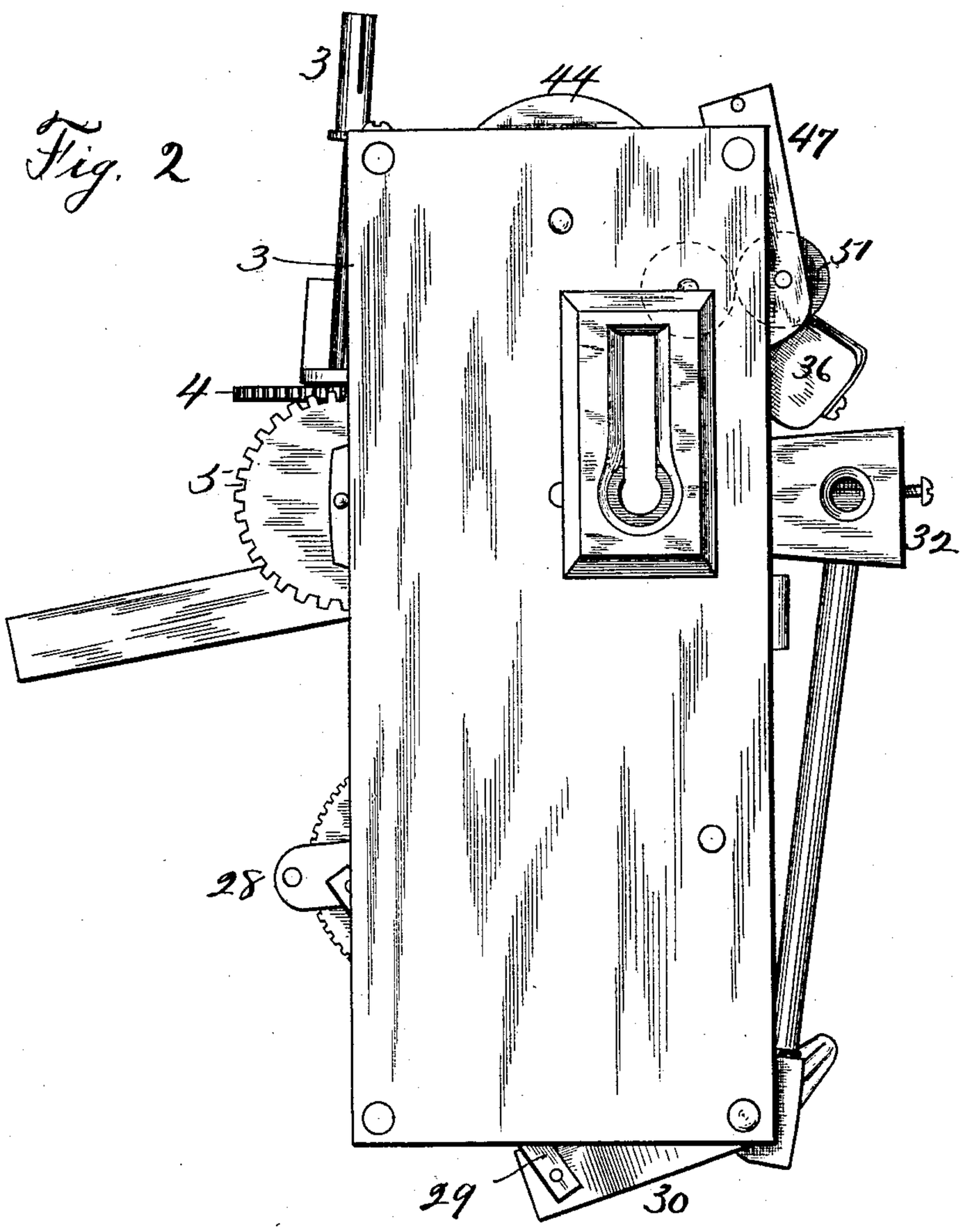
W. LE G. BUNDY.

WORKMAN'S TIME RECORDER.

No. 452,894. Patented May 26, 1891.

Fig. 2



Witnesses
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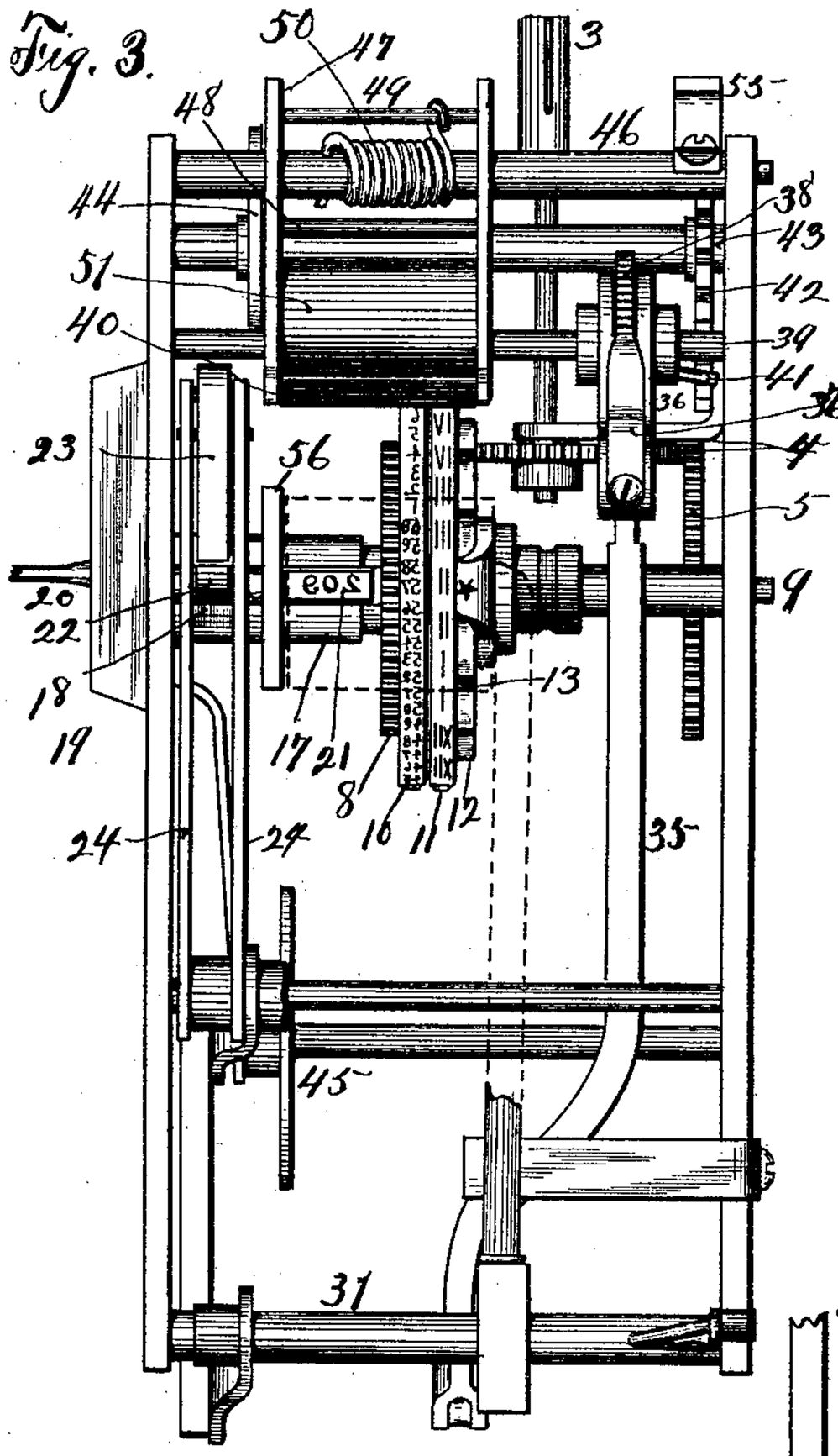
WORKMAN'S TIME RECORDER.

No. 452,894. Patented May 26, 1891.

Fig. 3.



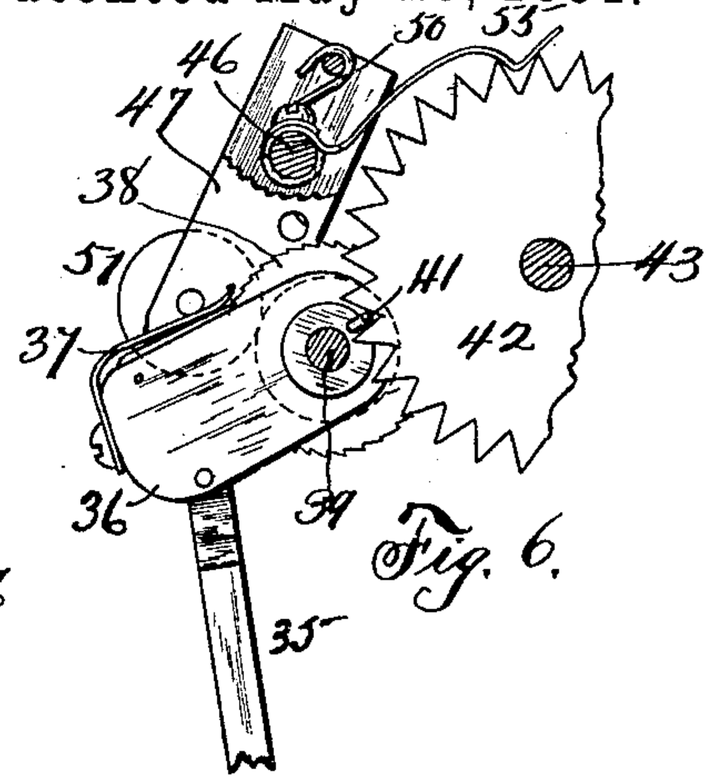


Fig. 6.

Fig. 7

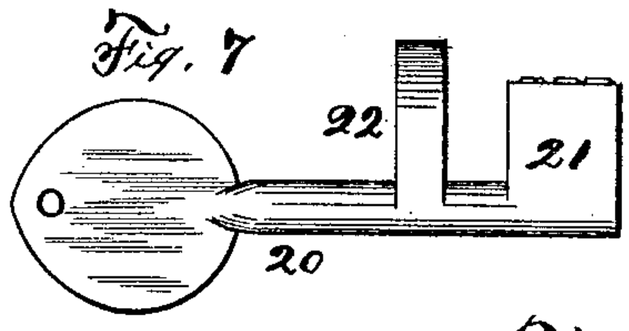


Fig. 8.

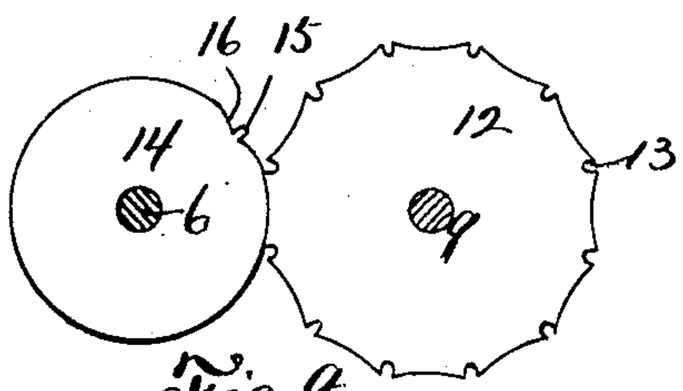
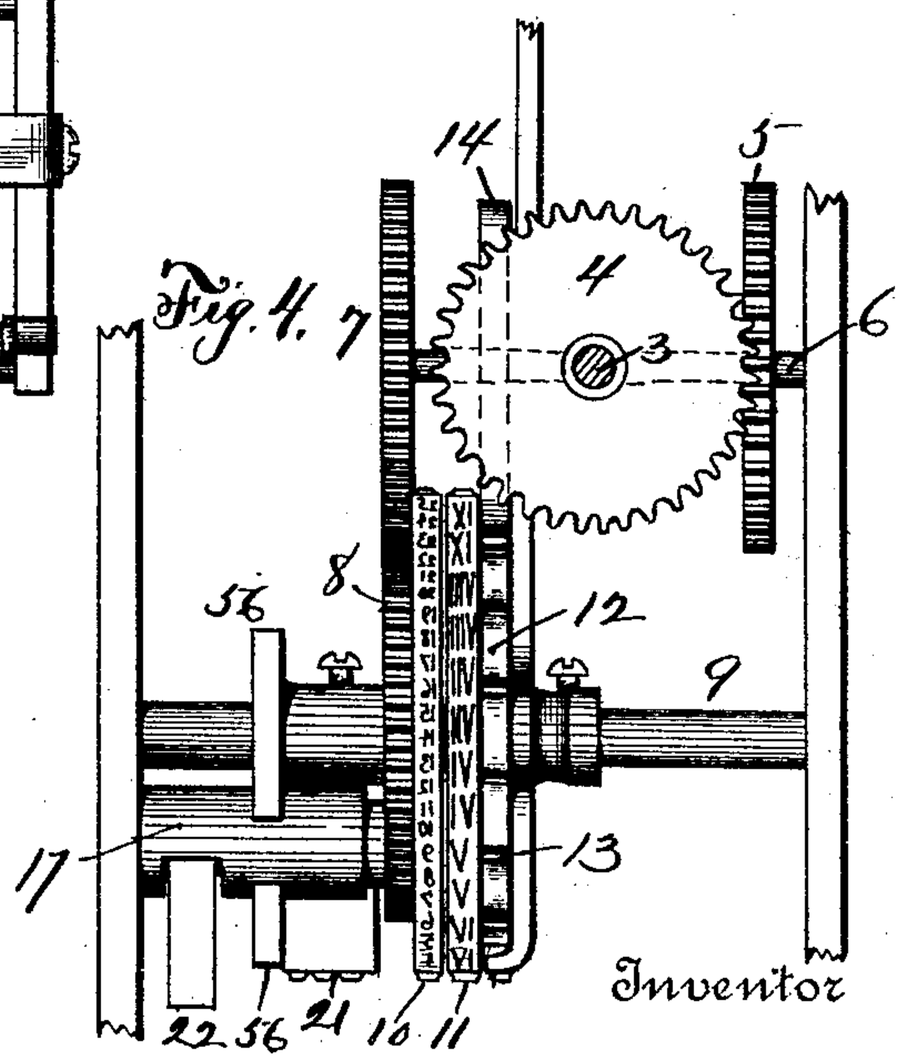


Fig. 9.

Fig. 4.



Witnesses
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WORKMAN'S TIME RECORDER.

No. 452,894. Patented May 26, 1891.

Fig. 11

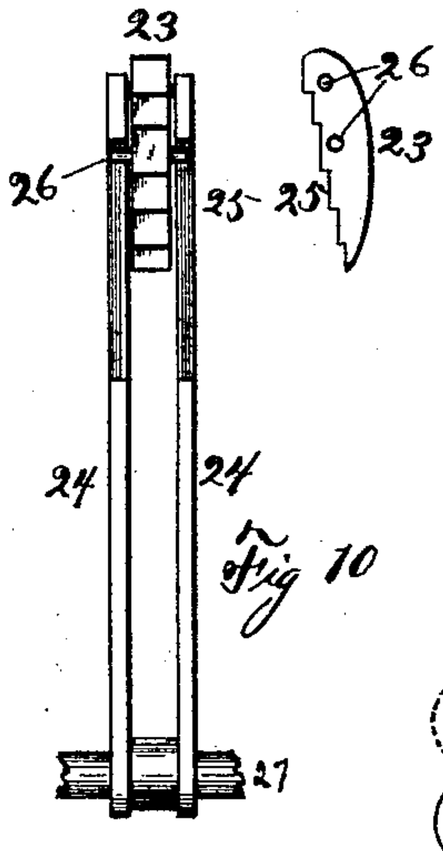

Fig 10

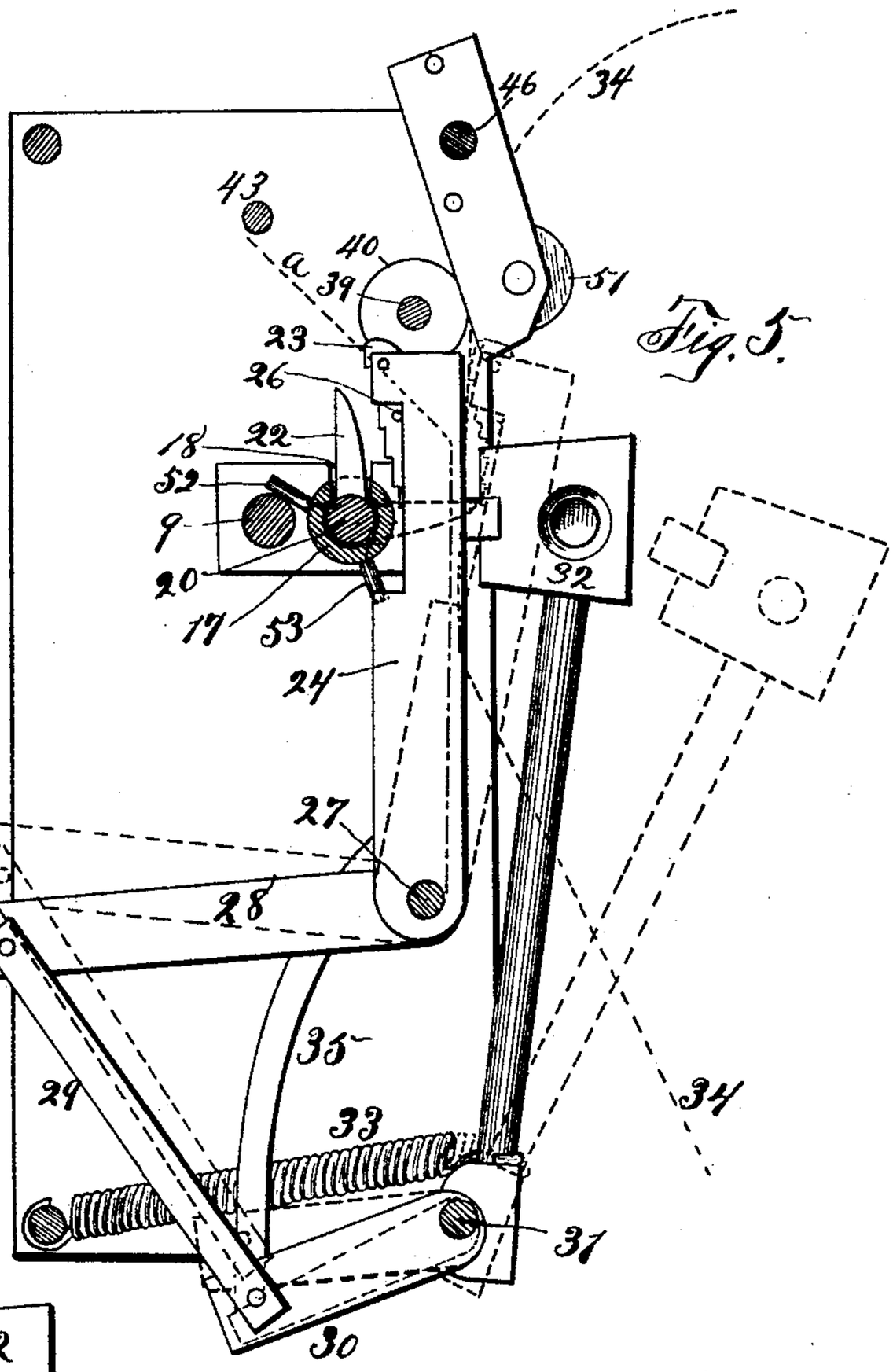

Fig. 5.

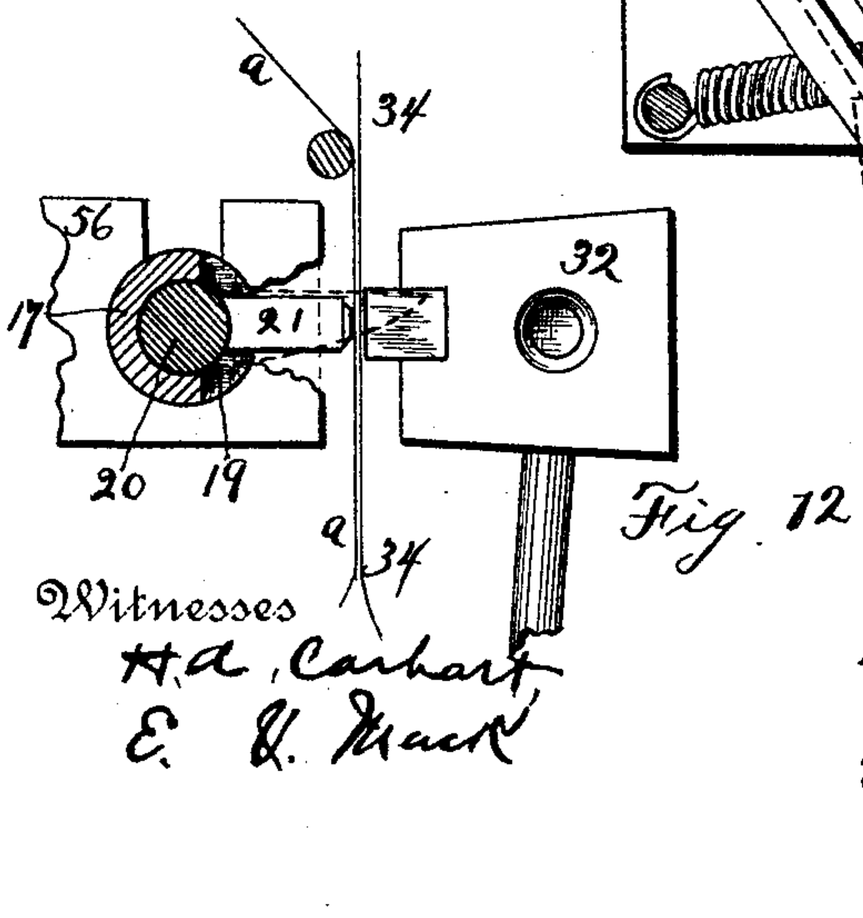

Fig. 12

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WORKMAN'S TIME RECORDER.

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Fig. 13.

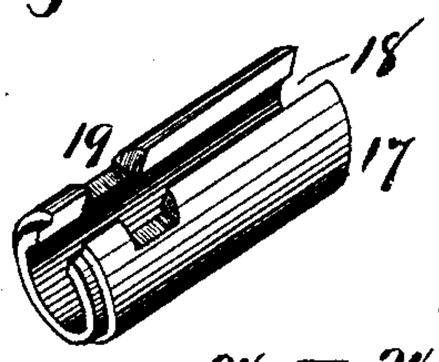


Fig. 14.

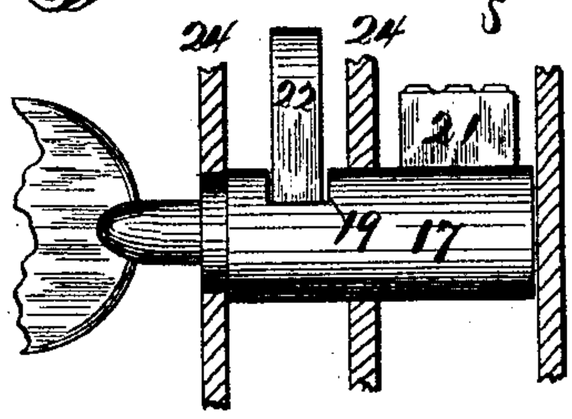


Fig. 16.

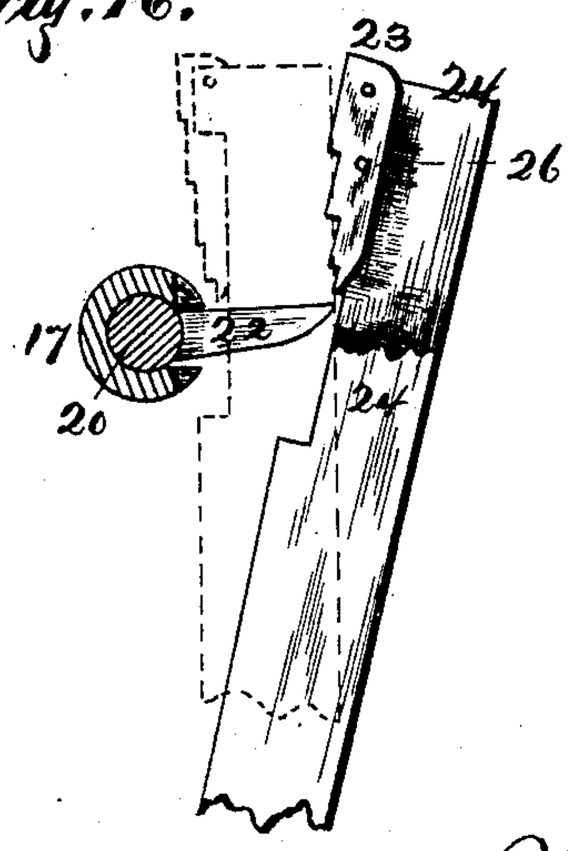


Fig. 17.

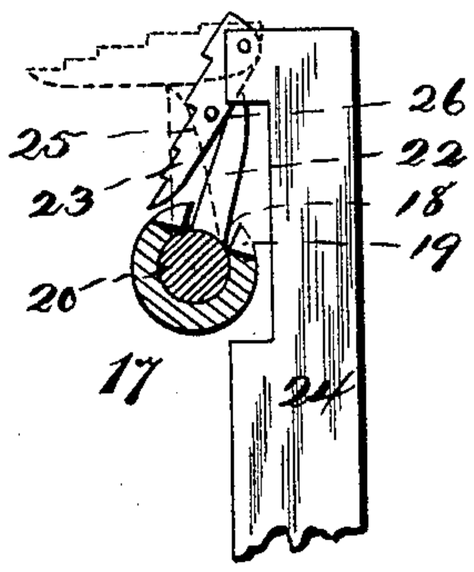
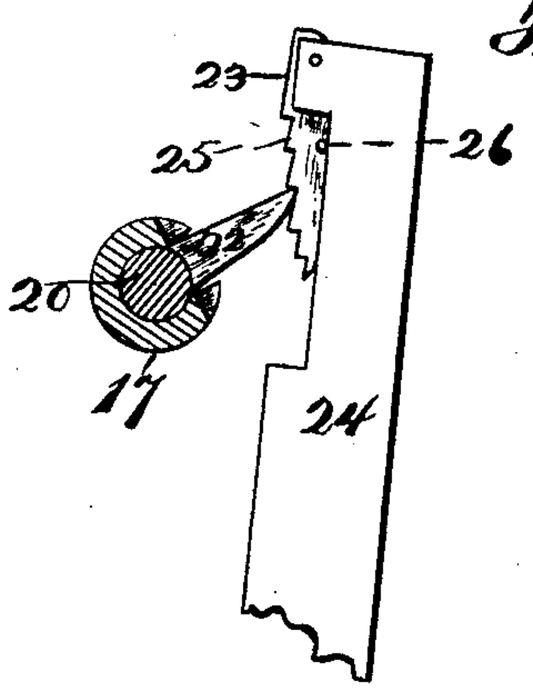


Fig. 15.



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UNITED STATES PATENT OFFICE.

WILLARD LE GRAND 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. 452,894, dated May 26, 1891.

Application filed December 13, 1890. Serial No. 374,617. (No model.)

To all whom it may concern:

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

My invention relates to time-recording mechanisms actuated directly by a clock or by connections to the clock, by which the time of the arrival or departure of workmen, employés, &c., is recorded by each of such employés themselves.

My object is to provide a mechanism by which each workman or employé in a shop or factory or the like will by his own act accurately record the time of his arrival or departure, thereby preventing all disputes, each workman having his own key and being known by an arbitrary number, which is embossed upon the bit of the key, and upon its being inserted and turned will present the embossed number in alignment with the numbers upon the hour and minute recording wheels, and through the agency of a hammer and pad thereon actuated by the key and a ribbon and strip of paper in proper juxtaposition the hour, minute, and the number of the key will be printed upon the paper, and a feed mechanism will shift the paper and ribbon a fixed space, ready for the operation of the printing mechanism by the next workman and the recording of his time and the number of his key, as before. Then the "time" of each workman is made up from the paper strip, crediting each one with the time between his arrival and departure, whether it be full time or only a part thereof.

My invention consists in the several novel features of construction and operation herein described, and which are specifically set forth in the claims hereunto annexed. It is constructed as follows, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of a clock having its front broken away to show the recording mechanism. Fig. 2 is an enlarged front elevation of the recording mechanism. Fig. 3 is a side elevation of the same, showing the impression-hammer and helve in partly dotted lines. Fig. 4 is a top plan of the hour and minute recording wheels, the mechanism for actuating them, inserted and turned into position in alignment with these wheels, ready for the making of the impression or print, as shown in Fig. 3. Fig. 5 is a sectional elevation of the recording mechanism, the front being removed, and the hour and minute wheels and the means for actuating them being also left off, and showing in dotted lines the position assumed by the hammer and helve and their operating mechanism when a key is turned and just at the instant when the hammer is about to be released by a slight further movement of the key. Fig. 6 is an elevation of the combined paper and ribbon feed mechanism detached. Fig. 7 is a side elevation of the key, having an arbitrary number upon a bit thereof and offset from and substantially parallel with the shank of the key. Fig. 8 is a top plan thereof. Fig. 9 is a sectional detail of the hour-recording wheel and the one-toothed gear for actuating it. Fig. 10 is a front elevation of the key-locking pawl, the parallel bars supporting it, and the shaft to which said bars are secured. Fig. 11 is a side elevation of the pawl detached. Fig. 12 shows the key turned in the key-holder and the hammer in the act of making an impression. Fig. 13 is an isometrical elevation of the key-receiver. Fig. 14 is a detached elevation of the receiver and key. Fig. 15 is a sectional elevation showing the key partly turned and the ward locked with the swinging pawl. Fig. 16 is a like view of the same parts, showing the key-ward just as it has passed the lower end of the pawl and released the hammer printing mechanism to strike its blow. Fig. 17 shows the same parts after a hammer-blow, and the key partly turned back and in the act of passing back through under the pawl.

A is the case inclosing a clock-work, upon the minute-shaft of which I mount a spur-gear 1, meshing with and rotating another gear 2, and the shaft 3, and gear 4, which engages with and rotates the gear 5, which is secured upon the horizontal shaft 6, which

rotates the gear 7 on this shaft, and this gear meshes with and rotates the gear 8, which is mounted loosely upon the shaft 9, and is either integral with or connected to the disk or minute-wheel 10, also loose on this shaft. Upon the periphery or outer face of the rim of this wheel consecutive figures from 1 to 60, both inclusive, are embossed. The gear 8 has sixty teeth or cogs, and the gears 1, 2, 4, 5, and 7 are all properly "timed" with the clock-movement, so that the minute-wheel rotates in exact time with the minute-hand. Upon the shaft 9 and alongside of the minute-wheel I mount loosely the hour-wheel 11, provided on its face with figures from 1 to 12, both inclusive. In the drawings, Fig. 4, I show each of these numbers duplicated, for reasons hereinafter set forth.

Integral with or connected with and mounted alongside of the hour-wheel 11 is the disk 12, loose upon said shaft. This disk has twelve notches 13 in its periphery or rim, and the rim is concaved between said notches, as shown. Another disk 14, mounted upon the shaft 6, is provided with a tooth 15 in a concavity 16 in its rim, and this tooth is adapted to engage successively with the notches upon the disk 12 with each rotation of the disk 14, and as this disk 14 is timed to rotate once in an hour each rotation will rotate the hour-wheel the distance of one hour-space thereon. Suitable collars on the shaft 9 hold the wheels and disks in place thereon.

The key-receiver 17 consists of a cylinder journaled upon its outer end in the casing, slotted longitudinally, as at 18, and notched transversely, as at 19, so that the shank 20 of the key will fit loosely in the barrel of the receiver. The bit 21 will move longitudinally and fit freely in the slot 18. The key is of substantially the form shown in Fig. 7, its ward 22 being beveled outwardly to its outer end, and its bit 21 has embossed upon its outer end a figure or series of figures or characters, or a name, which will designate a particular workman.

In this invention all of the keys are of the same size and form and vary only in the numbers upon the outer end of the bits thereof.

When the key is inserted in the receiver and turned, the receiver is rotated with it. The ward comes into contact with the key-locking pawl 23. This pawl is pivotally hung between the parallel bars 24 and has a convex outer face and a serrated or stepped inner face 25, and the key-ward comes into contact with these steps successively. A pin 26, Fig. 10, through the pawl bears with its projecting ends upon the parallel bars 24 and operates as a lever in conjunction with the key-ward to force these bars outward. This rotates the shaft 27, to which the bars are secured, raising the arm 28, secured to said shaft, which pulls up the connecting-rod 29 and arm 30, secured to the shaft 31, which carries the hammer-helve, and the partial rotation of this shaft throws the printing-hammer 32 away from the printing-point, all as shown in Fig. 5. Then as the key-ward at about a quarter-turn passes the lower end of the pawl this whole mechanism is released and the spring 33 throws the hammer against the paper strip 34 and inking-ribbon *a* and the face of the hour and minute wheels and against the figures upon the end of the bit of the key, and thus imprints upon the paper the number of the key, the hour, and the minute. As the key is turned the beveled point of the ward engages with and is locked by each step through the tension of the spring 33, so that the key cannot be turned back or removed until an impression has actually been made. The key-receiver, rotating with the key, forms a backing for the key when the impression-blow is struck and insures a good impression. A rod 35 is pivotally connected to the arm 30, and at its upper end is connected to the arm 36, and 37 is a pawl mounted thereon and engaging with the ratchet-wheel 38, the hub of which fits through the arm 36, and 39 is the shaft upon which the ratchet is secured. Upon this shaft 39, Fig. 3, a roller 40 is secured. Upon the hub of the ratchet-wheel is a pin or stud 41, adapted to engage with the teeth of the star-wheel 42 successively with each rotation of the ratchet. This star-wheel is secured upon the shaft 43, journaled transversely in the casing, and a ribbon-spool 44 is secured upon the shaft and rotates with it by the rotation of the star-wheel by the engagement of said pin with said star-wheel, so that this mechanism constitutes the ribbon-feed, the ribbon being wound below upon the spool 45, (see Fig. 3,) and is actuated whenever the ratchet is rotated a full revolution by the raising of the arm 30 of the hammer mechanism. A rod 46, Fig. 3, is journaled in the casing, and 47 are the side bars of a frame, which are secured upon said rod. 48 is a central cross-bar between these side bars. 49 is a top cross-bar, and 50 is a torsion-spring secured to said rod and connected to the top cross-bar, so that the torsion of the spring will press the roller 50, journaled in the bars 47, against the roller 40, and the rotation of the star-wheel and its shaft rotates the roller 40, and the grip upon the paper, these rollers, and the rotation of the roller 40 constitute the frictional paper-feed. The strip of paper is wound upon the roll 51, Fig. 1, and leads thence up in front of the printing-wheels and key outside of the ribbon to and between the feed-rollers.

As before stated, when the ward 22 of the key slips off from the lower end of the pawl 23 the hammer-impression mechanism is thereby released and the impression is made. When thus released, the pawl assumes its normal vertical position, as shown in Fig. 5, and the key-ward is horizontal, the same as the bit is shown in Fig. 12. This pawl is free to swing outward. Then as the key is turned back the ward will strike against the back side of and swing the pawl outward, and just before the

ward reaches a vertical position it passes out of its engagement with said pawl, which then falls back to its normal position. The back side of this pawl is curved so as to facilitate this disengagement of the ward from the frictional contact of the ward. When this ward then reaches a vertical position, the key can be withdrawn, and then only. This leaves the pawl and impression mechanism all in position ready to be operated by the next key.

It will be seen that the key makes only a quarter-turn to bring the bit upon the printing-line, that the impression is made at the instant it reaches that point, that a quarter-turn back enables me to remove the key, and that the whole operation of recording only occupies the minimum of time. A stop-pin 52, projecting from the key-receiver and engaging with the shaft, limits the backward rotation of this receiver when the key is turned back after an impression has been made, as aforesaid, and holds the receiver in position for the withdrawal of the key and for the insertion of the next key, and another stop 53 checks the forward rotation of the key and receiver when the key-bit reaches the printing-line.

As will be seen in Figs. 3 and 5, the pawl 23 is shown so long that it could not be swung outward by the key-ward, nor could it drop back, as above described, unless provision was made therefor. Accordingly I cut a notch 19 transverse to the receiver, through which the lower end of the pawl swings forward across over the receiver, and through which it drops back when disengaged from the key-ward. A pawl 55, Fig. 6, regulates the rotation of the star-wheel.

A guard-plate 56, Fig. 3, fitting between the bit and ward of the key, when it is turned holds the key in place longitudinally until it is turned back.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the key, the bit thereon carrying the numeral or character, the beveled ward upon said key, and the slotted receiver receiving the key, of a swinging pawl provided with a series of steps on its face, with which the key-ward successively engages.

2. The combination, with the key, its beveled ward and numbered bit, and the slotted key-receiver, of a swinging pawl provided with stops on its face, with which the key-ward successively engages, a frame with which said pawl engages when the key is turned, and intermediate mechanism actuated by the movement of said frame, by which the hammer is actuated, hour and minute registering wheels, and a recording-strip.

3. A clock-movement and hour and minute recording wheels, synchronous mechanism actuating said wheels, a key provided with a bit carrying numbers brought into alignment with the hour and minute wheels by the turning of the key, a recording-strip, and an impression-hammer, in combination as set forth.

4. A clock-movement, hour and minute recording wheels, synchronous mechanism actuating said wheels, a key provided with a bit carrying numbers brought into alignment with the hour and minute wheels by the turning of the key, a ward upon the key, a recording-strip, and an impression-hammer operated by mechanism actuated by the ward of said key as it is turned, in combination as set forth.

In witness whereof I have hereunto set my hand on this 9th day of December, 1890.

WILLARD LE GRAND BUNDY.

In presence of—

ASA J. CUMMING,

A. W. CUMMING.