

(No Model.)

4 Sheets—Sheet 1.

W. L. BUNDY.
TIME RECORDER.

No. 393,205.

Patented Nov. 20, 1888.

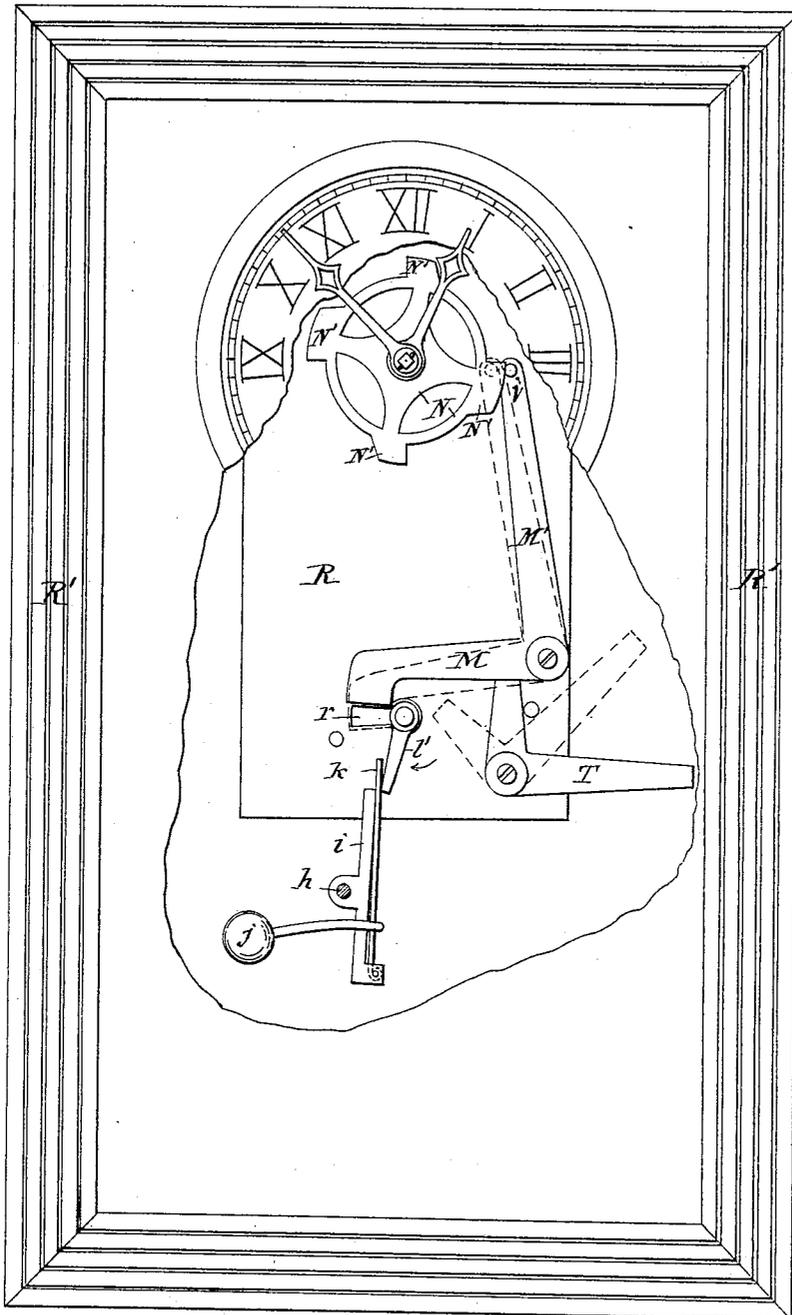


Fig. 1

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Shull, Laess & Shull

ATTORNEYS.

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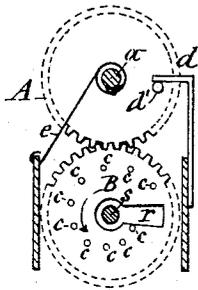
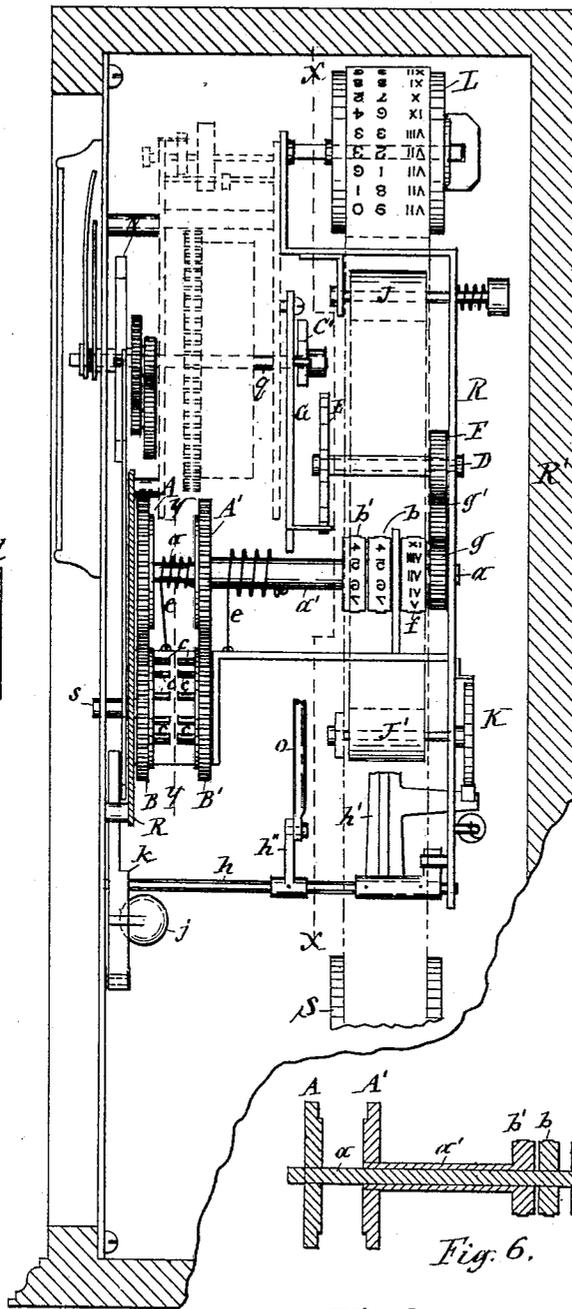


Fig. 5

Fig. 3

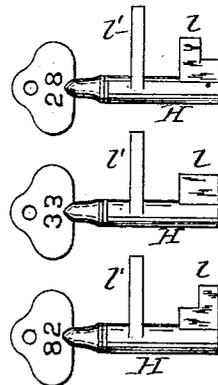


Fig. 7

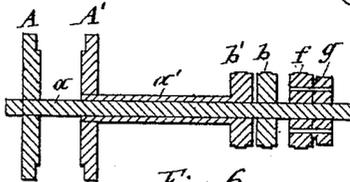


Fig. 6.

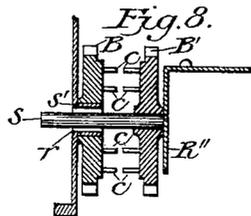


Fig. 8.

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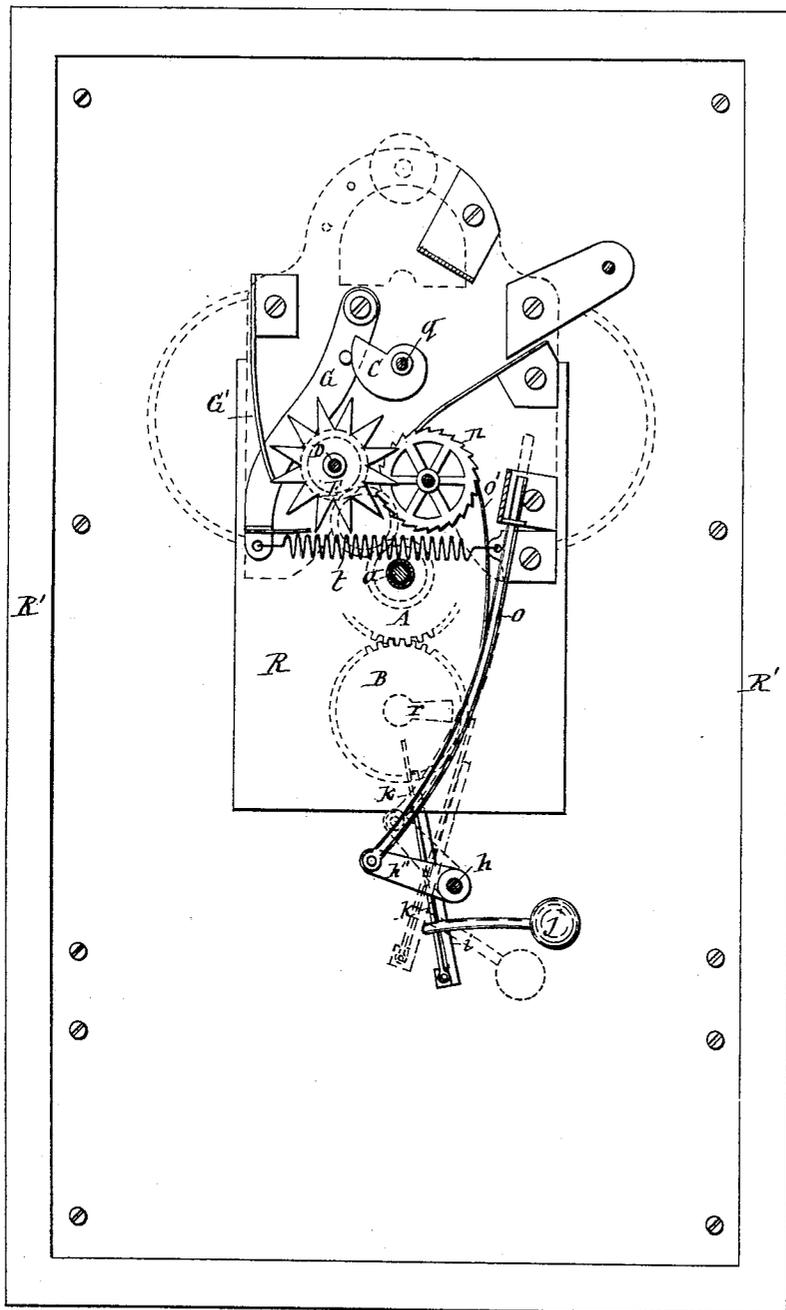


Fig. 4

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WILLARD L. BUNDY, OF AUBURN, NEW YORK.

TIME-RECORDER.

SPECIFICATION forming part of Letters Patent No. 393,205, dated November 20, 1888.

Application filed August 2, 1887. Serial No. 246,000. (No model.)

To all whom it may concern:

Be it known that I, WILLARD L. BUNDY, of Auburn, in the county of Cayuga, in the State of New York, have invented a new and useful Improved Time-Recorder, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

The purpose of this invention is to compel employes of factories and shops to record at their place of business the time of their entering the said place, and thus save the extra expense of watchmen or time-keepers usually employed for the aforesaid purpose; and to that end I employ, in connection with the time-clock mechanism, time-recording type-wheels, and operator's recording type-wheel, a wheel or wheels geared to transmit motion to the said type-wheels and provided with catches, either of different shapes or in different positions, or in both of said conditions, and manipulative keys of different shapes, each adapted to engage with a different catch on the aforesaid wheel; and the invention also consists in novel auxiliary devices connected with the aforesaid mechanism, all as hereinafter more fully described, and specifically set forth in the claims.

In the annexed drawings, Figure 1 is a front elevation of a clock embodying my invention. Fig. 2 is a rear elevation of the interior of said clock with my invention attached thereto. Fig. 3 is a side elevation of the same. Fig. 4 is a vertical section on line *x x*, Fig. 3. Fig. 5 is a sectional view taken on line *y y*, Fig. 3. Fig. 6 is a longitudinal section of the shaft which carries the type-wheels. Fig. 7 is a plan view of a number of manipulating-keys employed in the operation of my invention; and Fig. 8 is a detached vertical section of the wheels which are actuated directly by the keys, said view showing the supports of said wheels.

Similar letters of reference indicate corresponding parts.

R represents the main supporting-frame of the time-clock mechanism, and R' the case inclosing the same. The clock mechanism may be of any suitable and well-known type, and is therefore in most parts merely indicated by dotted lines.

The only features of the clock necessary for description of my invention are the frame R

and the spindle *g*, which carries the hands of the clock, to which frame and spindle and part of the case R' my invention is attached.

Parallel with the spindle *g* is a counter-shaft, D, pivoted to the frame R, and to opposite ends of said shaft are rigidly secured a star-wheel, E, and a gear-wheel, F. To the spindle *g* of the minute-hand I fasten a cam, C, and on the frame R, I pivot a pawl, G, in such a position as to be actuated by the aforesaid cam. Said pawl engaging the wheel E imparts intermittent motion to said wheel and its supporting-shaft D. By employing a single cam, as shown in Fig. 4 of the drawings, it is obvious that the aforesaid pawl and counter-shaft receive an impulse at the end of each revolution of the spindle of the minute-hand or at the end of every hour, and in this case I provide the wheel E with twelve teeth for the engagement of the pawl, and thus revolve the counter-shaft D once in twelve hours. The twelve periods of rest of the counter-shaft D are required when it is desired to allow the recording to be effected at the end of each hour.

A dog, G', attached at one end of the frame R and bearing with its free end on the wheel E, serves to prevent the reverse movement of said wheel.

a is another shaft, parallel with the counter-shaft and pivoted in the frame R. To one end of the shaft *a* is rigidly attached a gear-wheel, A, and on the opposite end of said shaft is loosely mounted a pinion or gear-wheel, *g*, and between this latter gear-wheel and the wheel F on the shaft D is a gear, *g'*, which is pivoted to the frame R and transmits motion from the wheel F to the wheel *g*, and thus the latter wheel is rotated intermittently and correspondingly with the counter-shaft D.

To the side of the gear-wheel *g* is rigidly fastened the time-recording type-wheel *f*, and near the latter is one of the operator's recording type-wheels *b*, fastened to the shaft *a*. Between this type-wheel *b* and gear-wheel A is a sleeve, *a'*, mounted loosely on the shaft *a*, and to the end of said sleeve, adjacent to the type-wheel *b*, is firmly secured the second operator's recording type-wheel *b'*, and to the opposite end of the sleeve is affixed the gear-wheel A', as best seen in Fig. 6 of the drawings. All of

the aforesaid type-wheels are of the same diameter, and the marks or figures are embossed on the peripheral faces of said type-wheels.

5 From the foregoing it will be observed that the operator's recording type-wheels are arranged concentrically side by side and operative independently of the time-recording type-wheel *f*, which features are essential to the
10 operation of the apparatus.

From each of the wheels A A' projects a lug or stop, *d'*, adapted to collide with a stationary stop, *d*, secured to the frame R, as shown in Fig. 5 of the drawings, and by means of
15 springs *e e*, coiled around the shaft *a* and sleeve *a'*, and each connected at one end to one of said parts and at the opposite end to the frame, the wheels A A' are caused to normally rest with their stops *d' d'* against the stationary
20 stop and hold the same yieldingly in said position.

B and B' are two gear-wheels arranged axially in line with each other and meshing with the wheels A A'.

25 The wheel B' is pivoted to a stud-pin, *s*, which is rigidly attached to a plate, R'', secured across the frame R back of said wheel, said stud-pin projecting through a hole in the front plate of the frame R, and from the back
30 of the latter plate projects a tubular stud-pin, *s'*, surrounding the stud-pin *s*, and having mounted on it rotatably the wheel B, as illustrated in Fig. 8 of the drawings. The annular space between the two stud-pins *s s'* form part
35 of a key-hole, *r*, which is formed with a lateral slot, and is formed in both the front plate of the frame and in the wheel B.

The wheels B B' are provided on their adjacent sides with a series of pins or projections, *c c c*, or other suitable catches, which are arranged in a line curved eccentric in relation to the axis of the wheel, as shown in Fig. 5 of the drawings. In connection with the said
40 wheels I employ keys H H of different shapes—one for each person required to record his or her time of entering the place of employment. Said keys are adapted to be entered through the key-hole *r*, so as to bring the lug *l* or other projection of the key to play between the
50 wheels B B'.

Each of the keys has a lug, *l*, of a different length or shape from those of the other keys, as illustrated in Fig. 7 of the drawings, and consequently each key, when turned between
55 the wheels B B', engages a different projection, *c*, on one or both wheels, and causes the wheels to turn either a greater or a less distance than the other keys, and since the wheels A A' turn with the wheels the type-wheels B B' are turned to a corresponding degree. The type-wheels have on their peripheries embossed numbers or other suitable markers, as hereinbefore stated, and facing the same is a platen, I, carried on the free end
60 of an arm, *h'*, which projects from a shaft, *h*, pivoted on the frame R. A spring, *t*, connected at one end to the frame and at the op-

posite end to the arm *h'*, draws the platen toward the type-wheels, as best seen in Fig. 2 of the drawings. From the shaft *h* projects also
70 a shank, *i*, on which is hinged a lever, *k*, which is held normally to rest on the shank by means of a weight, *j*, drawing the lever in said direction. The free end of the lever is normally in the path of a supplemental lug, *l'*, on the key
75 H, and stands in such relative position that in turning the key in the key-hole *r* the lug *l'* collides with the free end of the lever and depresses the same, and thereby presses the platen I from the type-wheels. Immediately before
80 the wheel has completed its revolution the lug *l'* slips from the lever K, and in releasing the same it allows the platen to strike toward the type-wheels, which are all of the same diameter, and thus receive uniformly the impact of the platen. The hinged connection of the lever K with the shank *i* allows the lug *l'* to pass freely over the lever during the return
85 movement of the key. Between the platen and type-wheels *b b b'* passes an ink-ribbon, P, one end of which is wound upon a spool, J, which is rigidly attached to a pivoted spindle and partially restrained from turning by friction produced on the spindle by a spring crowding the spindle endwise and causing a
90 collar on the end of the spindle to press on the side of the portion of the frame to which the spindle is pivoted, as shown in Fig. 3 of the drawings. The opposite end of the ink-ribbon is wound upon a spool, J', which is
95 fastened to a spindle pivoted on the frame, and has also secured to it a ratchet-wheel, K.

To the oscillating arm *h'*, which carries the platen I, is connected a pawl, P', which engages the ratchet-wheel K, and thus partially
105 rotates the same during each stroke of the platen. A dog, P'', attached to the frame, bears with its free end on the ratchet-wheel, so as to prevent retrograde movement of the same. (See Fig. 2 of the drawings.) Each
110 movement of the wheel K causes the spool J' to wind up a portion of the ink-ribbon and bring a new portion thereof in front of the type-wheels. Upon the spool S is wound a slip or band of blank paper, which passes from
115 thence between the ink-ribbon P and platen I to a winding-spool, L, which is actuated by a coil-spring connected at one end to the peripheral portion of the spool and at the opposite end to the shaft on which said spool is
120 loosely mounted.

Between the spool L and platen I is arranged the feed-roller *m*, for moving the paper ribbon at proper intervals. Said feed-roller is secured to a shaft pivoted to the frame R, to
125 which shaft is also fastened a ratchet-wheel, *n*, which receives motion from a pawl, *o'*, attached to a push-bar, *o*, which is connected at its lower end to the free end of an arm, *h''*, secured to the shaft *h*, as illustrated in
130 Fig. 4 of the drawings. In turning the said shaft by the engagement of the lug *l'* of the key H with the lever *k* the push-bar *o* is forced upward and causes the pawl *o'* to im-

part motion to the ratchet-wheel *n*, and thus turn the feed-roller *m* sufficiently to move the paper ribbon *P* the required distance. This is effected simultaneously with the movement of the platen from the type-wheels. Another roller, *m'*, pivoted to a suitable spring-arm and arranged opposite the feed-roller, serves to press the paper ribbon against said feed-roller.

The operation of the apparatus thus far described is as follows: The person entering his or her place of business inserts his or her key into the key-hole *r* and turns the key in the direction indicated by the arrows in Figs. 1 and 5 of the drawings. In doing this said person first turns the wheels *B B'*, and thereby causes the type-wheels *b b'* to turn into such a position as to present toward the platen *I* the number corresponding to that marked on the key, or the number by which the person using the key is known. By the time the type-wheels have assumed said position the lug *l* releases the previously-depressed lever *k* and allows the spring-actuated platen to strike the paper ribbon *u*, so as to receive the impression from the type-wheels, the wheels *b b'* imprinting the number by which the operator is known and the wheel *f* marking the hour or period of day during which the recording is made. If desired, the ink-ribbon may be dispensed with and the type or marks of the type-wheels sharpened sufficiently to make the necessary impression on the recording-paper. Inasmuch as it is desired to limit the time of recording, I employ a guard for opening and closing the key-hole *r*, said guard consisting of a gate, *M*, pivoted on the frame in such a position as to cause the gate to drop by gravity into a position to close the key-hole. From the guard or gate *M* is extended an arm, *M'*, from the free end of which projects a pin, *v*, which is in the path of cams *N' N'* on the periphery of a wheel, *N*, firmly secured to the spindle of the hour-hand. The collision of the said cams with the pin *v* crowds the arm *M'* aside, and thereby raises the guard or gate *M* clear of the key-hole *r*, as represented in Fig. 1 of the drawings. When the wheel *N* has turned sufficiently to carry the cam *N'* away from the pin *v*, the gate *M* automatically drops across the key-hole and closes the same; hence it will be observed that the periods of holding the key-hole open depend on the length of the cams *N' N'*, which may be made so as to cause the key-hole to be kept open for any desired periods.

In order to permit the person in charge of the recording apparatus to keep the guard *M* away from the key-hole when desired, I pivot to the front of the frame *R*, inside of the inclosing-case *R'*, a detent or latch, *T*, arranged in such a position as to allow said detent to engage and hold the guard *M* when raised from the key-hole *r*, as illustrated by full lines in Fig. 1 of the drawings.

Having described my invention, what I claim is—

1. A time-recorder comprising a clock mech-

anism, time-recording type-wheel, operator's recording type-wheel, a wheel geared to transmit motion to the latter type-wheel and provided with catches disposed in different positions thereon, and operator's manipulative keys of different shapes, each adapted to engage with a different catch on the aforesaid wheel, and thereby turn said wheel, and a platen movable toward and from said type-wheels, substantially as set forth.

2. In combination with the clock mechanism and time-recording type-wheel geared to receive motion from said clock mechanism, the operator's recording type-wheel arranged concentrically with the time-recording type-wheel and operative independently thereof, wheels geared to transmit motion to the operator's recording type-wheels, projections on said geared wheels arranged in different positions, and operator's keys of different shapes, each adapted to engage with a different projection on the aforesaid wheels, substantially as described and shown.

3. In combination with the time-clock mechanism, the cam *c'*, connected to the hand spindle, the pawl *G*, actuated by said cam, the counter-shaft *D*, the wheel *E*, fixed to said counter-shaft and actuated by the aforesaid pawl, the pivoted type-wheel *f*, gears arranged to transmit motion from the counter-shaft to the type-wheels, the type-wheel *b*, operative independently of the type-wheel *f*, a platen arranged movably to and from the aforesaid type-wheels, a recording sheet or band passing between the platen and type-wheels, and manipulative keys adapted to actuate both the platen and the type-wheel *b*, substantially as set forth.

4. In combination with a time-clock mechanism and time-recording type-wheel actuated by said mechanism, operator's recording type-wheels operated independently of the clock mechanism, all of said type-wheels carrying their printing-faces on their peripheries, and being of the same diameters and concentric with each other, a platen arranged movably to and from the printing-faces of the type-wheels, and manipulative keys adapted to operate the operator's recording type-wheels and the platen, substantially as described and shown.

5. A time-recording apparatus comprising recording type-wheels, spring-restrained wheels actuating the said type-wheels and having projections in different relative positions, and manipulative keys having lugs or projections of different lengths and all graduated to allow each key to engage a different projection on each of the aforesaid wheels, substantially as set forth.

6. In combination with the type-wheel, a wheel adapted to actuate the type-wheels and having lateral projections arranged in a line curved eccentrically in relation to the axis of said actuating-wheel, and keys adapted to be revolved on the axis of said wheel, and each of the said keys having a lug of different lengths

from those of other keys, substantially as described and shown.

7. The combination of the shaft *a*, the type-wheel *b*, and gear A, secured to opposite ends of said shaft, the sleeve *a'*, mounted loosely on the shaft *a*, the type-wheel *b'*, and gear A', secured to opposite ends of the sleeve, the gear-wheels B and B', meshing with the gears A A', the projections *c c c* on the adjacent sides of the wheels B B' and arranged in lines curved eccentrically in relation to the axes of said wheels, and keys adapted to be revolved on the axes of the wheels B B', with the lugs of the keys between said wheels, and the lug of each key being of a different length from those of the other keys, substantially as described and shown.

8. The combination of the shaft *a*, the type-wheel *b*, and gear A, secured to opposite ends of said shaft, the sleeve *a'*, mounted loosely on the shaft *a*, the type-wheel *b'*, and gear A', fastened to opposite ends of the sleeve, the stationary stop *d*, stops *d' d'*, projecting from the gears A A' and adapted to collide with the stationary stop, springs *e e*, holding the said gears to rest with their stops yieldingly on the stationary stops, the gear-wheels B B', meshing with the gears A A', the projections *c c* on the adjacent sides of the wheels B B' and arranged in lines curved eccentrically in relation to the axis of said wheel, keys adapted to enter their lugs between the wheels B B', and the lug of each key being of a different length from those of the other keys, substantially as described and shown.

9. In combination with the time-clock mechanism, the shaft *a*, the type-wheel *f*, mounted loosely on one end of said shaft, the gear *g*, secured rigidly to the side of the type-wheel, a train of gears for transmitting motion from the clock mechanism to the gear *g*, the type-wheel *b*, and gear A, rigidly attached to opposite ends of the shaft *a*, the sleeve *a'*, mounted loosely on said shaft, the type-wheel *b'*, and gear A', fastened to opposite ends of the sleeve, the gear-wheels B B', meshing with the gears A A', the projections *c c c* on the adjacent sides of the wheels B B' and arranged in lines curved eccentrically in relation to the axis of the wheels, and keys adapted to be revolved on the axis of the wheels B B', with the lugs of the keys between said wheels, and the lug of each key being of a different length from those of the other keys, substantially as described and shown.

10. In combination with the time-clock mechanism, the cam C, secured to the spindle of the minute-hand, the counter-shaft D, the wheel E, and gear F, rigidly attached to said

counter-shaft, the pawl G, actuated by the cam C and imparting motion to the wheel E, the pivoted shaft *a*, the type-wheel *f*, mounted loosely on said shaft, the gear *g*, secured rigidly to the side of said type-wheel, the intermediate gear, *g'*, transmitting motion from the gear F to the gear *g*, the type-wheel *b* and gear A, rigidly secured to the shaft *a*, the sleeve *a'*, mounted loosely on said shaft, the type-wheel *b'* and gear A', fixed to the sleeve, the gear-wheels B B', meshing with the gears A A', the eccentrically-arranged projection *c c* on the adjacent sides of the wheels B B', keys H, having lugs of different lengths and adapted to turn between the wheels B B', stops for supporting said wheels in their normal position, and springs for restoring the wheels from their actuated position to their normal position, substantially as shown.

11. In combination with the type-wheels, the shaft *h*, arm *h'*, extending from said shaft and carrying the platen I, the shank *i*, projecting from the shaft, the lever *k*, hinged on the shank and sustained normally resting on the same, and the key H, provided with the lug *l*, adapted to engage the lever *k*, substantially as set forth.

12. In combination with the type-wheel, the spring-actuated paper-winder L, the feed-roller *m*, ratchet-wheel *n*, secured to the shaft of said feed-roller, roller *m'*, held automatically in proximity to the feed-roller, the shaft *h*, having projecting from it the arms *h'* and *h''* and shank *i*, the platen I, carried on the arm *h'*, the push-bar *o*, extending from the arm *h''*, pawl *o'* on said rod engaging the ratchet-wheel *n*, the lever *k*, hinged on the shank *i*, the weight *j*, connected to said lever, and the key H, provided with the lug *l*, adapted to engage the lever *k*.

13. In combination with the type-wheel, the oscillatory arm *h'*, platen I, carried on said arm, the tension-spool J, the winding-spool J', ratchet-wheel *k*, attached to the shaft of the winding-spool, the ink-ribbon P, running from the spool J to the spool J', the pawl P', attached to the arm *h'* and imparting motion to the ratchet-wheel, and the dog P'', for preventing the retrograde movement of the ratchet-wheel, substantially as described.

In testimony whereof I have hereunto signed my name, in the presence of two witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 29th day of July, 1887.

WILLARD L. BUNDY. [L. S.]

Witnesses:

HOWARD P. DENISON,
C. L. BENDIXON.